

ILLUSTRATIONS OF ZOOLOGY:

INVERTEBRATES AND VERTEBRATES.

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OF
ZOOLOGY:
INVERTEBRATES & VERTEBRATES.

BY
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YOUNG J. PENTLAND.

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TO
J. C. EWART, M.D.,
REGIUS PROFESSOR OF NATURAL HISTORY IN THE UNIVERSITY
OF EDINBURGH,

THIS WORK IS DEDICATED BY HIS FORMER PUPILS,

THE AUTHORS.

P R E F A C E.

THIS book is a companion to a course of Systematic Zoology. The need of such a book has become obvious to us from some years of teaching. The study of Class-Types, now a part of every systematic course, is already well provided for by Professor ROLLESTON'S "Forms of Animal Life," and the many books that have modelled themselves upon it. The Zoological Laboratory, too, is not without its many and admirable Text-Books. There is room, however, and need for a form of book such as we offer to the public in these Illustrations of Zoology. In it the student will find illustrated, by Diagram or Drawing, the structure of forms selected from all the great Classes of Vertebrates and Invertebrates, and the illustrations arranged in systematic order. Our design is to help the student of Comparative Anatomy in the most important and the most difficult part of a systematic Course of Lectures.

In dealing with the Vertebrates, we could have wished to illustrate types of all the Orders as well as of the Classes, but to have done this would have made the book larger and more expensive without making it proportionally more useful. Besides, the general text-books, as a rule, give with a fair degree of fulness the chief features of the Vertebrate Orders.

The system of class-naming that we have followed is the system used by the late Professor F. M. BALFOUR in his Classification. We give in an Appendix a Classified Index, showing the forms illustrated according to the system of classification used by CLAUSS.

The Drawing in Plate 46, Fig. 4, is taken, with Messrs. MACMILLAN & Co.'s kind permission, from Professor HOWES'S "Elementary Atlas of Biology." The Diagram in Plate 15, Fig. 5, is one of VON GRAFF'S, modified by JOHN BLAND

PREFACE.

SUTTON, Esq., F.R.C.S., who has kindly permitted us to use his modification. Except these and some others, whose source is acknowledged in the letterpress, all the illustrations are taken from actual specimens, preparations, or dissections.

The Drawings of Microscopic Specimens were first made to scale by means of the camera, and then reduced. The sizes are given by a fraction. Thus $\frac{300}{5}$ means that the Drawing was made under a power of three hundred diameters, and then reduced to one-fifth of the size. “ $\times 1$ ” signifies the natural size of the object.

Dr. H. ALEXIS THOMSON supplied us with several specimens of Animal Parasites, and Dr. CARRINGTON PURVIS has given us much assistance in methods of Preparing and Staining. Dr. LESLIE MACKENZIE gave us much valuable help while the book was passing through the press.

W. RAMSAY SMITH.

J. STEWART NORWELL.

EDINBURGH, *April* 1889.

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4.	„	„	<i>Aurelia.</i>
5.	„	„	ACTINOZOA— <i>Actinia.</i>
6.	„	ECHINODERMATA—	<i>Asterias.</i>
7.	„	PLATYHELMINTHES—NEMERTEA—	<i>Borlasia, Polia.</i>
8.	„	„	TREMATODA— <i>Distomum.</i>
9.	„	„	CESTOIDEA— <i>Tænia.</i>
10.	„	NEMATHELMINTHES—NEMATODA—	<i>Trichina.</i>
11.	„	„	CHÆTOGNATHA— <i>Sagitta.</i>
„	„	„	ACANTHOCEPHALA— <i>Echinorhynchus.</i>
12.	„	ROTIFERA—	<i>Rotifer.</i>
„	„	GEPHYREA—	<i>Sipunculus.</i>
13.	„	CHÆTOPODA—	<i>Lumbricus.</i>
14.	„	HIRUDINEA—	<i>Hirudo.</i>
15.	„	MYZOSTOMEA—	<i>Myzostoma.</i>
16.	„	MOLLUSCA—LAMELLIBRANCHIATA—	<i>Anodon.</i>
17.	„	„	ODONTOPHORA— <i>Helix.</i>
18.	„	POLYZOA—	<i>Bugula, Membranipora.</i>
„	„	BRACHIOPODA—	<i>Lingula.</i>
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20.	„	„	Appendages.
21.	„	„	„
22.	„	„	Internal Organs.
23.	„	„	Special Organs and Appendages.
24.	„	TRACHEATA—INSECTA—	<i>Periplaneta.</i>
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„	„	PYCNOGONIDÆ—	<i>Pycnogonum.</i>
„	„	LINGUATULIDÆ—	<i>Pentastomum.</i>
27.	„	HEMICHORDATA (ENTEROPNEUSTA)—	<i>Balanoglossus.</i>
28.	„	TUNICATA—	<i>Phallusia (Ascidia).</i>
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30.	„	CYCLOSTOMATA—	<i>Myxine, Petromyzon.</i>

PLATE 31. Class—PISCES — ELASMOBRANCHII — *Raia* — External Characters and Viscera.

32.	32.	32.	32.	32.	Circulatory System.
33.	33.	33.	33.	33.	33.
34.	34.	34.	34.	34.	Skeleton.
35.	35.	35.	35.	35.	35.
36.	36.	36.	36.	36.	Nervous System and Sense Organs.
37.	37.	37.	37.	37.	Urino-genital System.
38.	38.	38.	TELEOSTEI— <i>Gadus</i> —	38.	External Characters and Viscera.
39.	39.	39.	39.	39.	Circulatory System.
40.	40.	40.	40.	40.	Skeleton.
41.	41.	41.	41.	41.	Skull.
42.	42.	42.	42.	42.	Kidney, Swimbladder, Genital Organs.
43.	43.	43.	43.	43.	Nervous System and Sense Organs.
44.	44.	44.	AMPHIBIA— <i>Rana</i> —	44.	External Characters.
45.	45.	45.	45.	45.	Viscera.
46.	46.	46.	46.	46.	Circulatory System.
47.	47.	47.	47.	47.	47.
48.	48.	48.	48.	48.	Skeleton.
49.	49.	49.	49.	49.	49.
50.	50.	50.	50.	50.	Nervous System.
51.	51.	51.	51.	51.	Urino-genital System.
52.	52.	52.	REPTILIA— <i>Lacerta</i> —	52.	External Characters, Alimentary and Circulatory Systems.
53.	53.	53.	53.	53.	Skeleton.
54.	54.	54.	54.	54.	Brain and Urino-genital System.
55.	55.	55.	AVES— <i>Columba</i> —	55.	External Characters.
56.	56.	56.	56.	56.	Alimentary and Respiratory Systems.
57.	57.	57.	57.	57.	Circulatory System.
58.	58.	58.	58.	58.	Skeleton.
59.	59.	59.	59.	59.	59.
60.	60.	60.	60.	60.	60.
61.	61.	61.	61.	61.	Brain and Urino-genital System.
62.	62.	62.	MAMMALIA— <i>Lepus</i> —	62.	External Characters, Tongue, Larynx.
63.	63.	63.	63.	63.	Viscera.
64.	64.	64.	64.	64.	Circulatory System.
65.	65.	65.	65.	65.	Skeleton.
66.	66.	66.	66.	66.	66.
67.	67.	67.	67.	67.	67.
68.	68.	68.	68.	68.	Nervous System and Eye.
69.	69.	69.	69.	69.	Urino-genital System, Male.
70.	70.	70.	70.	70.	Female.

ILLUSTRATIONS OF ZOOLOGY:

INVERTEBRATES AND VERTEBRATES.

PLATE I.

Class—PROTOZOA.

Amæba.

FIG. 1.—AMÆBA: FREE. $\times 300$.

ec. ectosarc: *en.* endosarc: *n.* nucleus: *p.* pseudopodium: *f.* food particles and food vacuoles: *v.* contractile vacuole.

FIG. 2.—AMÆBA: ENCYSTED. $\times 300$.

FIGS. 3, 4, 5.—VARIOUS STAGES IN REPRODUCTION BY FISSION. $\times 300$.

Gregarina.

FIG. 1.—GREGARINA OF THE EARTHWORM. $\times 50$.

ec. ectosarc bounded by the capsule: *en.* endosarc: *n.* nucleus.

FIGS. 2, 3, 4, 5, 6.—REPRODUCTION BY CONJUGATION.

p. pseudo-navicellæ.

THE SLIPPER-ANIMALCULE (*Paramæcium*).

FIG. 1.—PARAMÆCIUM. $\times \frac{300}{2}$.

m. mouth: *p.* pharynx: *ec.* ectosarc: *c.* cuticle, with cilia projecting through it: *en.* endosarc: *n.* nucleus: *v.*¹, *v.*² contractile vacuoles.

FIG. 2.—POSTERIOR END: SHOWING TRICHOCYSTS PROTRUDED. $\times \frac{300}{2}$.

THE BELL-ANIMALCULE (*Vorticella*).

FIG. 1.—VORTICELLA: EXTENDED. $\times \frac{300}{4}$.

m. mouth: *d.* disc: *n.* nucleus: *v.* contractile vacuole: *s.* stalk with contractile fibre.

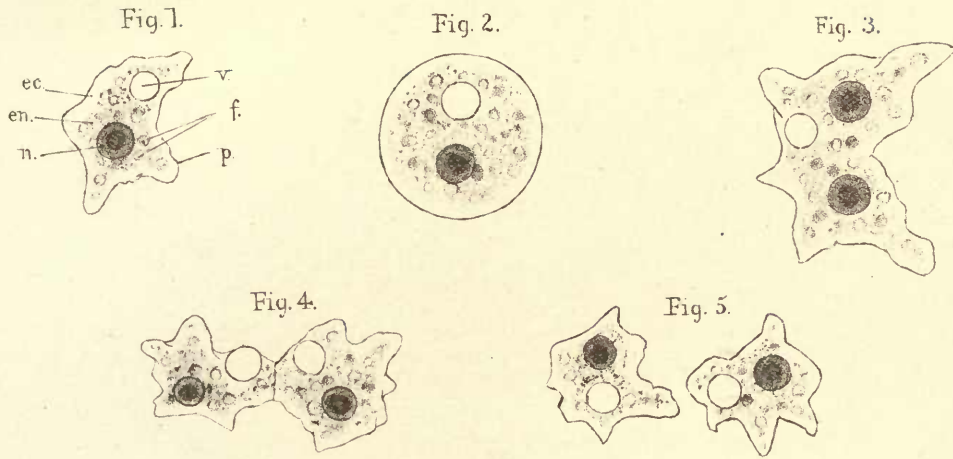
FIG. 2.—VORTICELLA: CONTRACTED. $\times \frac{300}{4}$.

n. nucleus: *v.* contractile vacuole: *f.* food vacuoles.

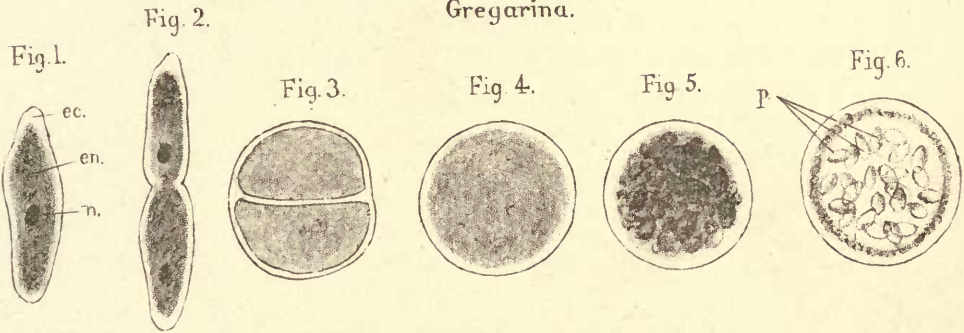
FIG. 3.—VORTICELLA: CONJUGATION. $\times \frac{300}{4}$.

FIG. 4.—VORTICELLA: UNDERGOING FISSION. $\times \frac{300}{4}$.

Amœba.



Gregarina.



Vorticella.

Paramœcium.

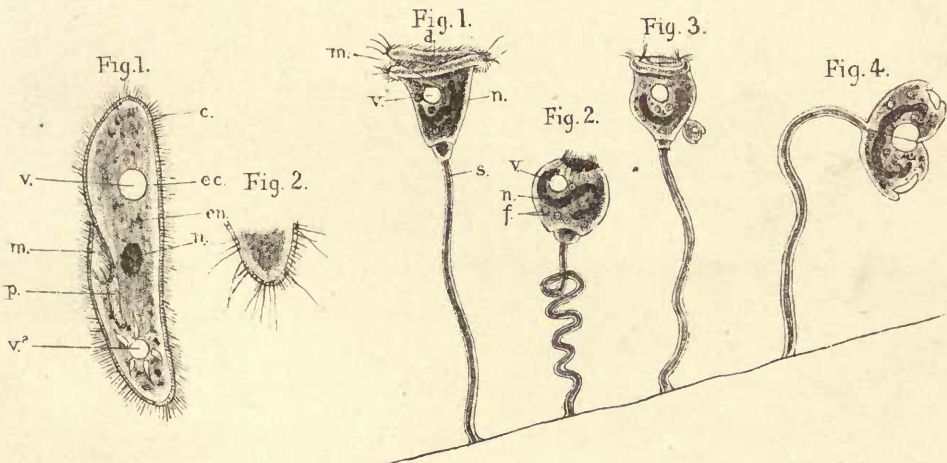


PLATE II.

Class—PORIFERA.

A HOLLOW CALCAREOUS SPONGE (*Grantia compressa*).

FIG. 1.—TWO SPECIMENS, ONE WITH A SINGLE EXHALANT OPENING OR OSCULUM, THE OTHER WITH TWO SUCH OPENINGS. $\times 1$.

FIG. 2.—SHOWING PART OF THE BODY WALL RAISED TO EXPOSE THE INTERNAL CAVITY. $\times 1$.

FIG. 3.—PART OF THE EXTERNAL SURFACE, SHOWING THE TRI-RADIATE SPICULES ARRANGED AROUND THE INHALANT OPENINGS. $\times 50$.

FIG. 4.—PART OF THE SAME. $\times 600$.

FIG. 5.—LONGITUDINAL SECTION OF ONE OF THE INCURRENT CANALS (SEEN ON MAKING A TRANSVERSE SECTION OF THE SPONGE). (From nature, and partly after Bowerbank.) $\times 400$.

FIG. 6.—FLAGELLATE COLLARED MONADS. $\times 1200$.

FIG. 7.—ONE OF THE MONADS. $\times 1800$.
n. nucleus: *c.* collar: *f.* flagellum.

Fig. 1.

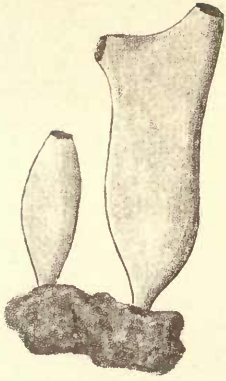


Fig. 2.

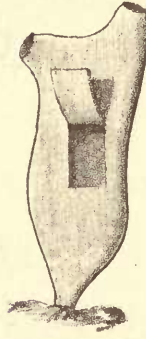


Fig. 3.

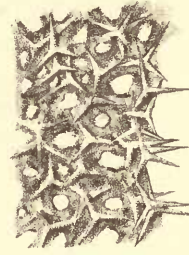


Fig. 4.

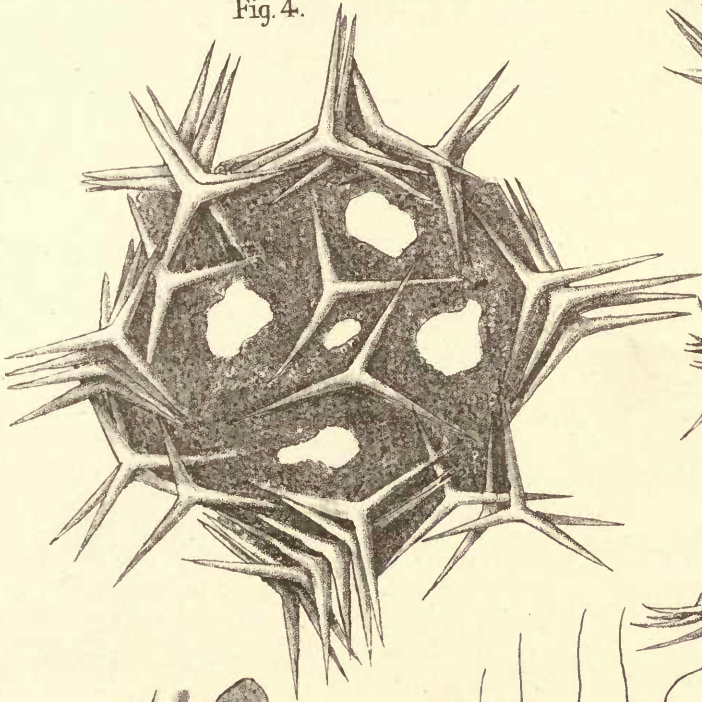


Fig. 5.

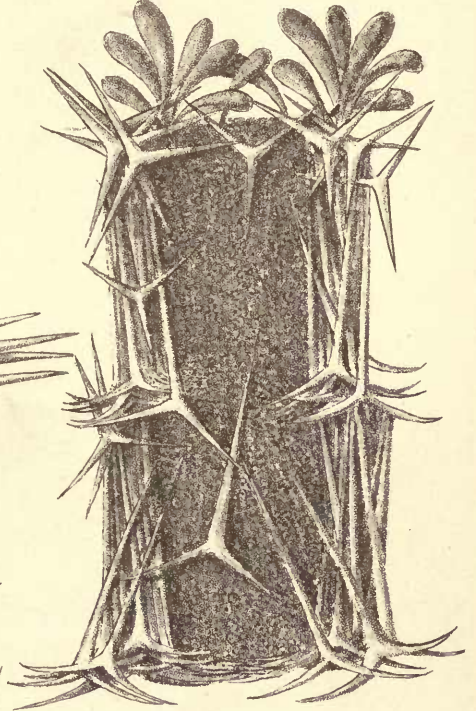


Fig. 6.

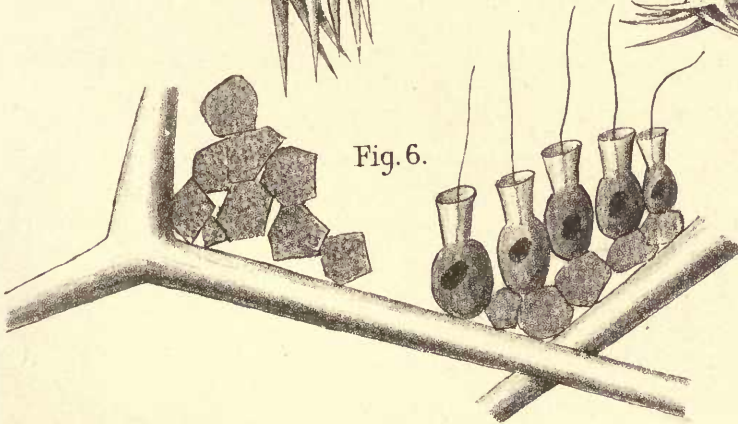


Fig. 7.

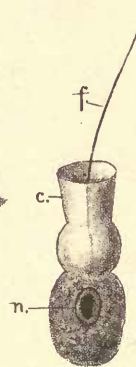


PLATE III.

Class—CŒLEENTERATA.

HYDROZOA.

THE FRESH-WATER POLYPE (*Hydra*).

FIG. 1.—HYDRA (*H. viridis*): BUDDING. $\times 10$.

t. tube: *f.* foot: *m.* mouth: *tn.* tentacles: *b.* bud.

FIG. 2.—HYDRA (*H. viridis*): REPRODUCING BY SEXUAL PROCESS. $\times 10$.

o. ovary: *t.* testes: *c.* oral cone, with the mouth at its apex.

FIG. 3.—TRANSVERSE SECTION THROUGH THE TUBE OR BODY. $\times \frac{5}{3}^{\circ}$.

ec. ectoderm: *en.* endoderm: *c.* "body-cavity."

FIG. 4.—TRANSVERSE SECTION THROUGH THE TUBE, AND NEARLY LONGITUDINAL SECTION THROUGH A TENTACLE. $\times \frac{5}{3}^{\circ}$.

*t*¹. tube: *t*². tentacle.

FIG. 5.—LONGITUDINAL SECTION THROUGH THE TUBE. $\times \frac{6}{3}^{\circ}$.

ec. ectoderm cells with *n.* nuclei: *n*¹, *n*² nematocysts: *m.* supporting lamella: *i.* interstitial cells: *en.* endoderm cells with *n.* nuclei, *v.* vacuoles, and *f.* food vacuoles: *c.* cilia.

FIG. 6.—ECTODERM CELLS ISOLATED. $\times 300$.

n. nucleus: *p*¹, *p*² neuro-muscular processes.

FIG. 7.—NEMATOCYSTS: BEFORE AND AFTER EVERSION OF THE THREAD. $\times 700$.

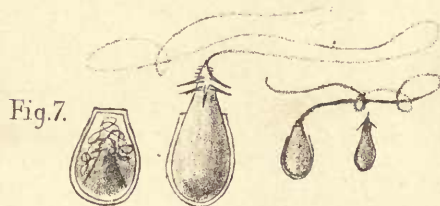
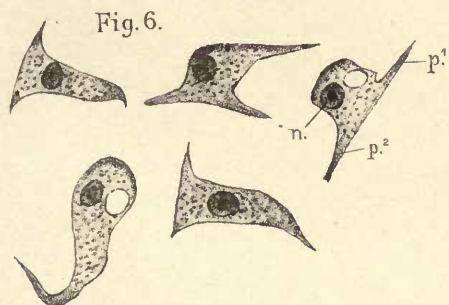
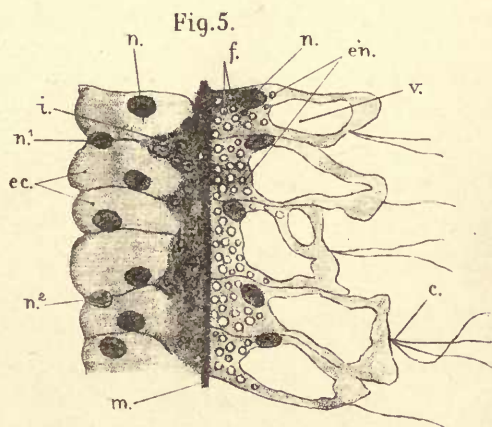
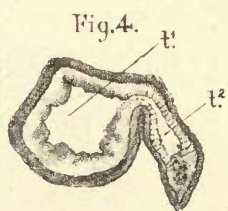
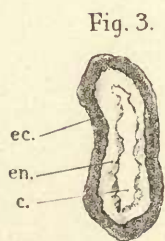
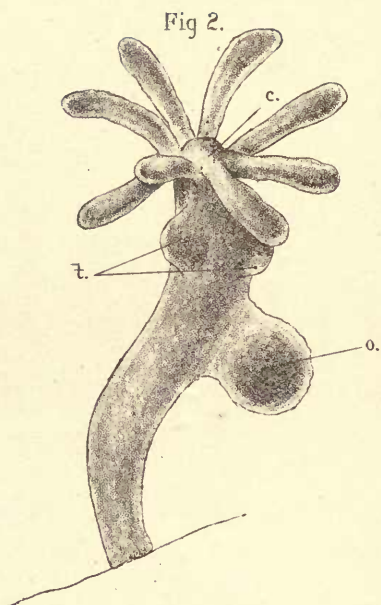
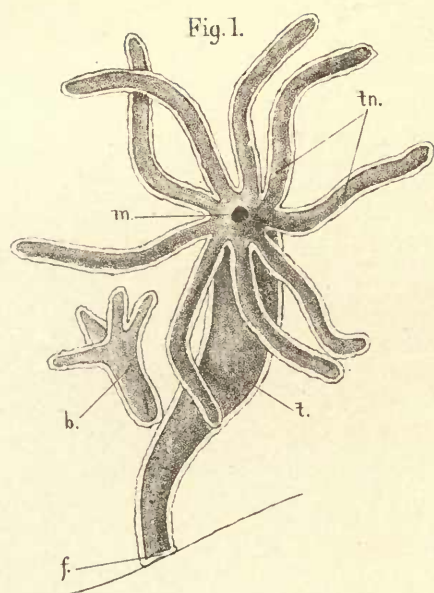


PLATE IV.

Class—CŒLENTERATA—*continued*.

HYDROZOA—*continued*.

THE JELLY-FISH (*Aurelia aurita*).

FIG. 1.—AURELIA: SIDE VIEW. $\times 1\frac{1}{3}$.

t. mouth-tentacles: *m. t.* marginal tentacles: *s.* sense organ: *g.* genital sac.

FIG. 2.—AURELIA: DORSAL VIEW. $\times 1\frac{1}{3}$.

s. position of stomach: *r.* radial canal: *c.* circular canal: *s. o.* sense organ: *g.* genital sac.

FIG. 3.—AURELIA: VENTRAL VIEW. $\times 1\frac{1}{3}$.

t. tentacles: *o.* opening of sub-genital pit: *f.* genital frill.

FIG. 4.—LONGITUDINAL VERTICAL SECTION THROUGH THE GENITAL POUCHES.
 $\times 1$.

g. gastric cavity: *o.* genital organ: *p.* opening into the sub-genital pit.

FIG. 5.—AURELIA: LIFE HISTORY. (After Sars).

a. free swimming embryo: *b.* scyphistoma stage: *c., d.* strobila stage: *e., f.* ephyra stage, developing through *g.* and *h.* into the mature Aurelia.

Fig. 1.

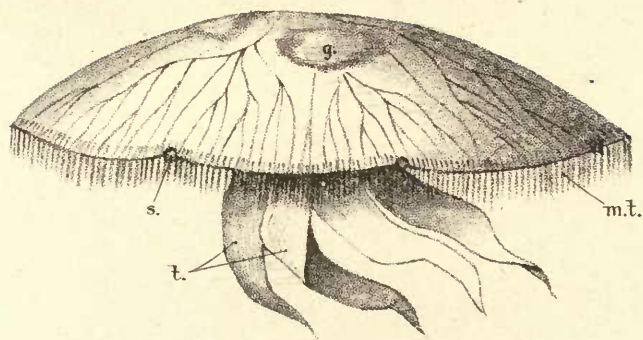


Fig. 3.

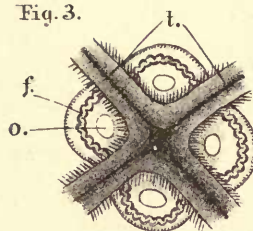


Fig. 2.

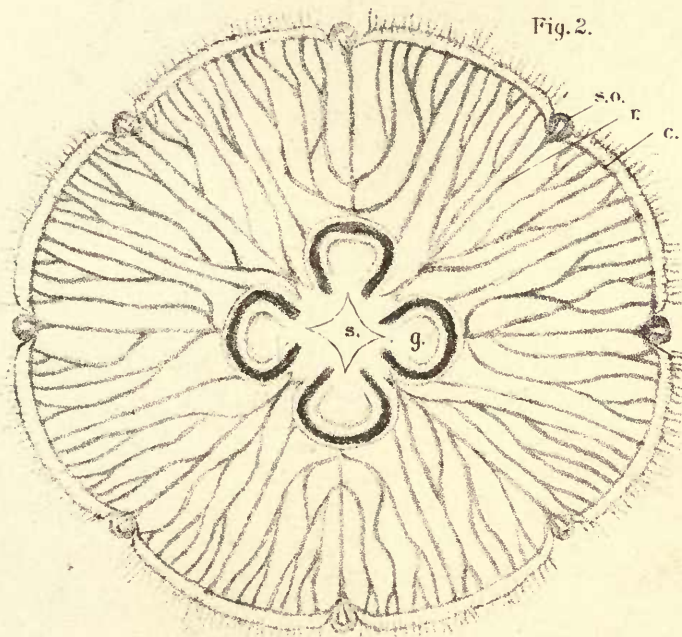


Fig. 4.



Fig. 5.

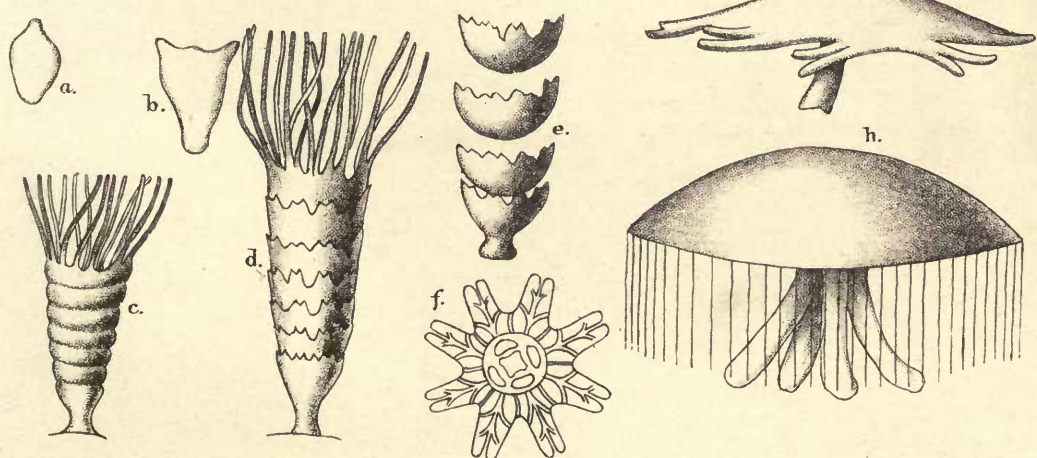


PLATE V.

Class—CŒLEENTERATA—*continued*.

ACTINOZOA.

THE SEA-ANEMONE (*Actinia*).

FIG. 1.—ACTINIA : CONTRACTED. $\times 1$.

c. column: *p.* pedal disc: *t.* tentacles.

FIG. 2.—ACTINIA : EXPANDED. $\times 1$.

FIG. 3.—MOUTH, FROM ABOVE, SURROUNDED BY THE TENTACLES. $\times 2$.

FIG. 4.—DISSECTION. $\times 1$.

m. mesentery or septum: *t.* inner surface of the throat-tube or oesophagus: *r.* reproductive organs attached to the surfaces of the mesenteries: *s.* secondary septa.

FIG. 5.—LONGITUDINAL SECTION.—(After Hertwig.)

t. tentacles: *o.* oesophagus hanging down into the gastro-intestinal cavity: *r., r.* reproductive organs: *m.* mesentery: *c.* one of the craspeda: *a.* one of the acontia.

FIG. 6.—ACTINIA : REPRODUCING BY GEMMATION. $\times 1$.

Fig. 2.

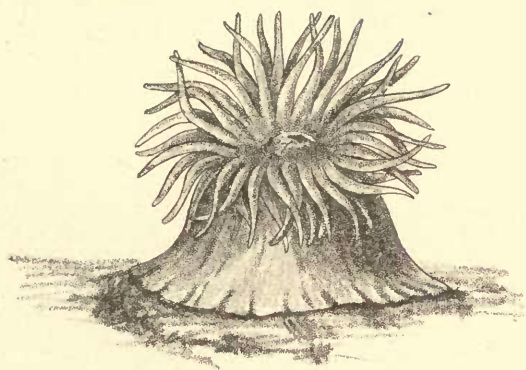


Fig. 1.

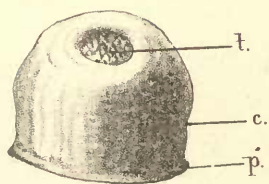


Fig. 4.

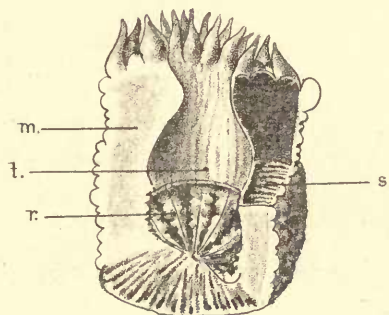


Fig. 3.

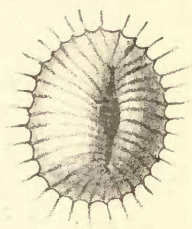


Fig. 5.

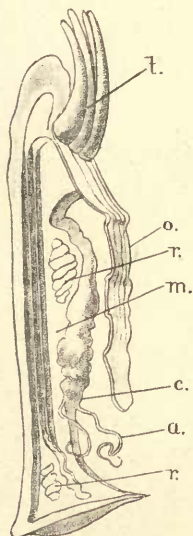


Fig. 6.

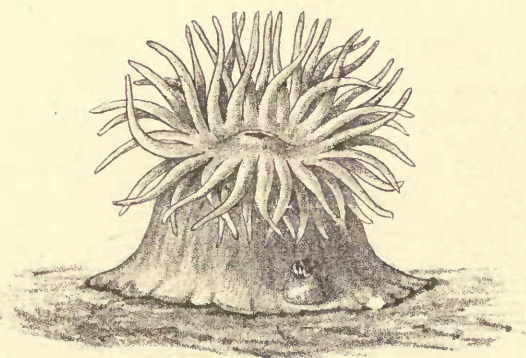


PLATE VI.

Class—ECHINODERMATA.

THE STAR-FISH (*Asterias*).

FIG. 1.—DISSECTION FROM THE DORSAL ASPECT. $\times \frac{2}{3}$.

m. madreporic tubercle: *b.*, *b.* rays of the bivium: *t.*, *t.*, *t.* rays of the trivium: *s.* stomach: *c.* hepatic cæca: *o.* ovaries: *a.* ampullæ.

FIG. 2.—TRANSVERSE SECTION OF AN ARM. $\times 1\frac{1}{3}$.

h. hepatic cæca: *o.* ovary: *a.* ampulla: *p.* pedicel or tube foot: *w.* water-vessel: *b.* blood-vessel: *n.* nerve.

FIG. 3.—DIAGRAM OF THE WATER-VASCULAR SYSTEM.

m. madreporic tubercle: *s.* stone canal: *c.* circular vessel: *r.* radial vessel: *p.* polian vesicle: *a.* ampulla: *t.* tube foot.

FIG. 4.—NERVOUS SYSTEM. $\times 1$.

o. œsophagus: *c.* circum-œsophageal nerve ring: *r.* radial nerve trunk.

FIG. 5.—PEDICELLARIÆ. $\times 10$.

Fig. 1.

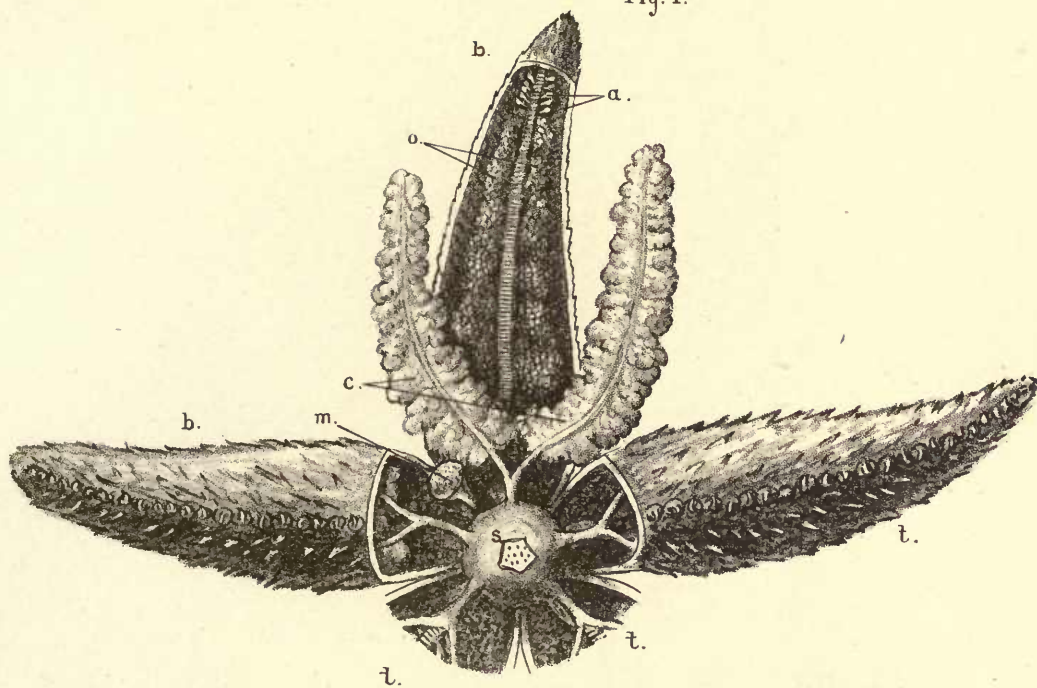


Fig. 2

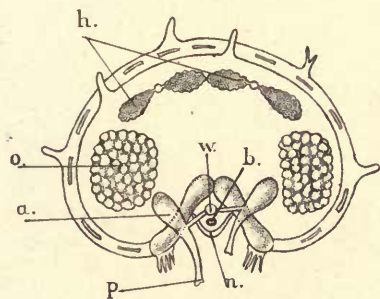


Fig. 4.

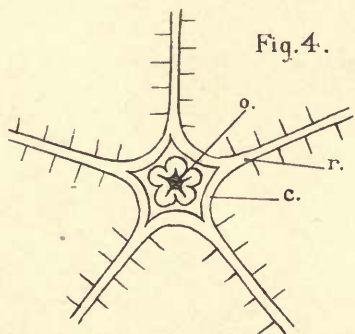


Fig. 3.

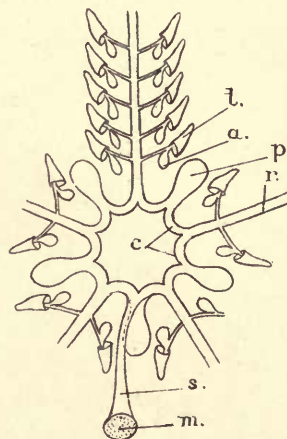


Fig. 5.

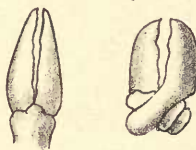


PLATE VII.

Class—PLATYHELMINTHES.

NEMERTEA.

Borlasia and *Polia*.

FIG. 1.—BORLASIA : HEAD, MIDDLE AND TAIL PORTIONS. × 1.

h. head : *m.* part of the body : *t.* tail.

FIG. 2.—BORLASIA : ANTERIOR PORTION, VIEWED AS A TRANSPARENT OBJECT.

—(After Quatrefages.) × 4.

m. mouth : *p.* ciliated pit : *e.* groups of eyes : *v.* cephalic blood-vessel :
c. n. cephalic nerves, given off from *g.* cerebral ganglia : *n.*
lateral nerve cord : *d.* dorsal blood-vessel : *l.* lateral blood-
vessel : *pb.* proboscis : *g.* genital organs.

FIG. 3.—POLIA : STYLE-FORMING APPARATUS.—(After Quatrefages.)

p. proboscis : *i.* intestine : *s.* stylet : *g.* gland of the stylet : *c*¹. cavity
of the completely formed stylet *s.* : *c*². cavity containing
stylets in process of formation : *o*¹, *o*² anterior and posterior
dilatations of the œsophagus.

FIG. 4.—TRANSVERSE SECTION THROUGH THE ANTERIOR PORTION OF A
NEMERTINE (species ?). × 10.

p. proboscis : *s.* sheath of the proboscis : *n.* lateral nerve cord :
o. œsophagus.

Fig. 1.

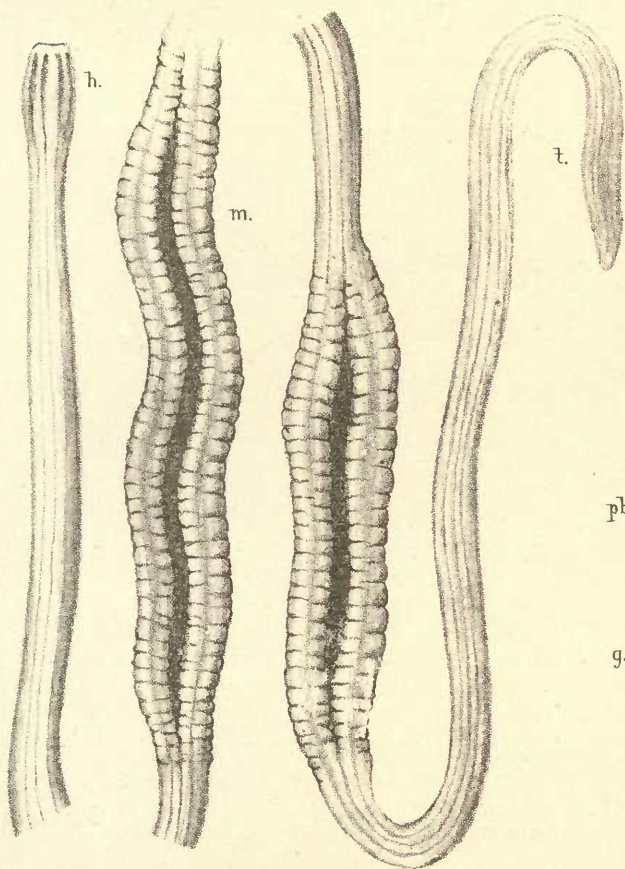


Fig. 2.

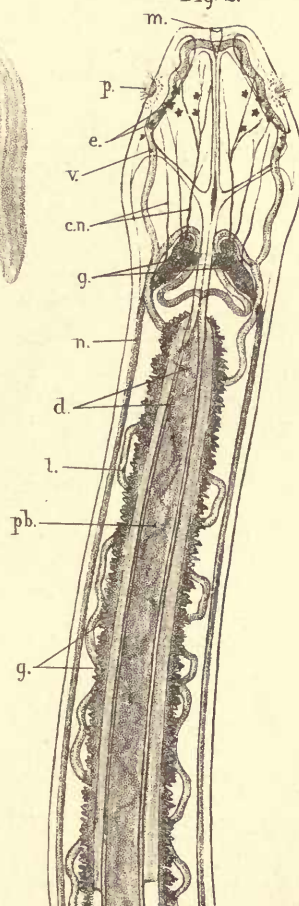


Fig. 3.

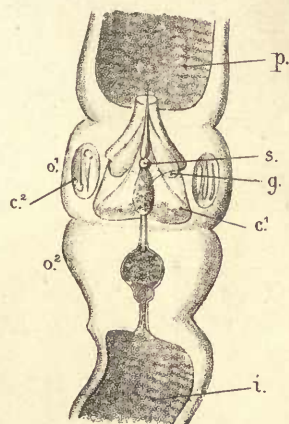


Fig. 4.

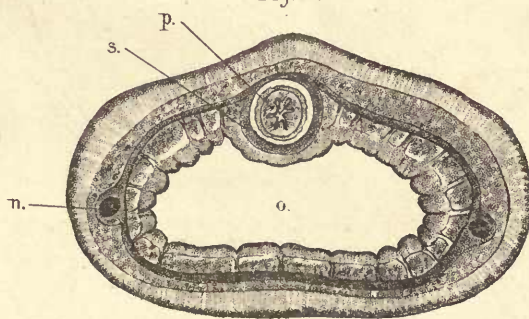


PLATE VIII.

Class—PLATYHELMINTHES—*continued.*

TREMATODA.

THE LIVER-FLUKE (*Distomum lanceolatum*).

FIG. 1.—DISTOMUM: VENTRAL VIEW. $\times 2$.

a. anterior sucker: *p.* posterior sucker.

FIG. 2.—MATURE DISTOMUM: VENTRAL VIEW.—(After Sommer.) $\times 5$.

m. mouth: *ph.* pharynx: *c.* part o. the digestive system: *p.* penis (cirrus): *u.* uterus: *o.* ovary: *s.* shell gland: *y.* yolk gland: *d.* duct of the yolk gland: *t.* testis: *v.*¹, *v.*² vasa deferentia.

FIG. 3.—YOUNG DISTOMUM.—(After La Valette.)

m. mouth: *ph.* pharynx: *i.* intestine: *s.* posterior sucker: *t.* trunk of the water-vascular system: *d.* main duct: *p.* excretory pore.

FIG. 4.—CILIATED EMBRYO: CONTRACTED.—(After Leuckart.)

FIG. 5.—CILIATED EMBRYO: ATTACHED TO THE WALL OF THE PULMONARY CAVITY OF *Limnæus truncatulus*.—(Partly after Leuckart).

FIG. 6.—SPORO CYST: with *c.* cercariæ.—(After Leuckart.)

FIG. 7.—REDIA.—(After Leuckart.)

m. mouth: *ph.* pharynx: *i.* intestine: *c.* cercaria.

FIG. 8.—CERCARIA.—(After Leuckart.)

s. sucker: *i.* intestine: *c.* excretory organ.

Fig. 1.

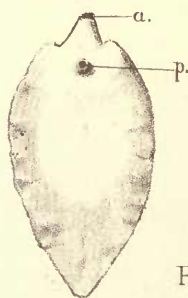


Fig. 2.

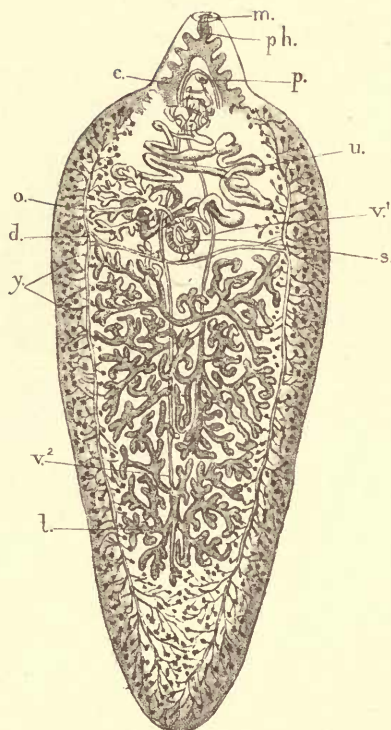


Fig. 3.

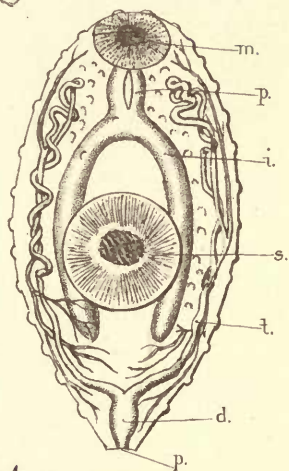


Fig. 4.



Fig. 6.

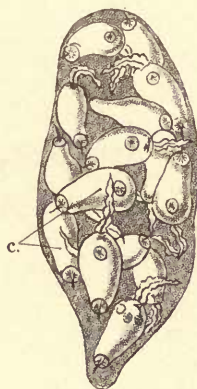


Fig. 7.

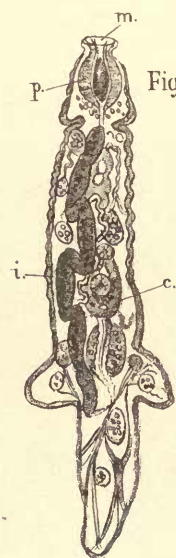


Fig. 8.

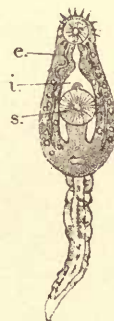


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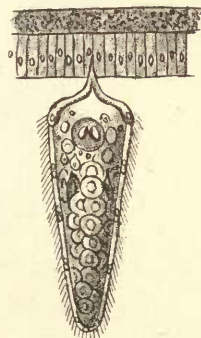


PLATE IX.

Class—PLATYHELMINTHES—*continued*.

CESTOIDEA.

THE TAPE-WORM (*Tænia solium*).

FIG. 1.—TAPE-WORM. $\times 1$.

FIG. 2.—HEAD: WITH THE CIRCLE OF HOOKLETS AND THE FOUR SUCKERS.
 $\times 12$.

FIG. 3.—HEAD: SIDE VIEW. $\times \frac{30}{5}$.

FIG. 4.—HOOKLETS. $\times 50$.

FIG. 5.—PROGLOTTIDES. $\times \frac{50}{4}$.

w. water vessel: *u.* uterus: *t.* testis: *v.d.* vas deferens: *va.* vagina:
o. ovary: *s.* shell-gland: *y.* yolk-gland.

FIG. 6.—RIPE PROGLOTTIS. $\times 2$.

u. uterus: *o.* genital opening.

FIG. 7.—STAGES IN THE DEVELOPMENT OF THE TAPE-WORM.—(After Leuckart.)

a. egg with embryo: *b.* embryo: *c.* head, growing as a hollow papilla
on the wall of the vesicle: *d.* cysticercus with retracted head:
e. cysticercus with protruded head.

Fig. 1.

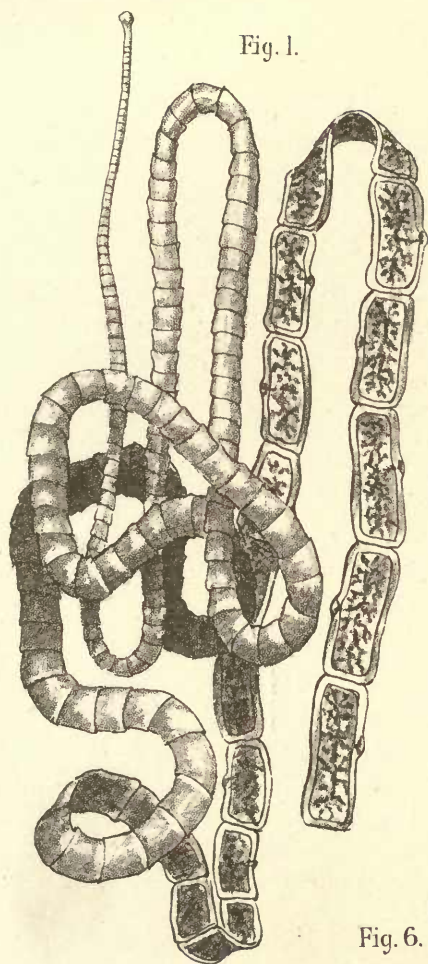


Fig. 2.

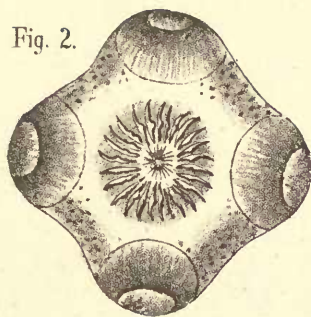


Fig. 3.



Fig. 4.



Fig. 5.

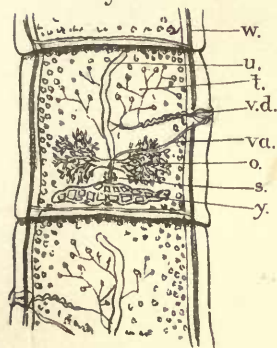


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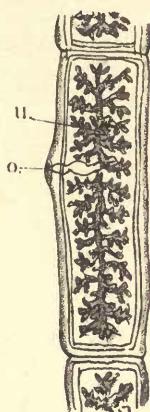


Fig. 7.

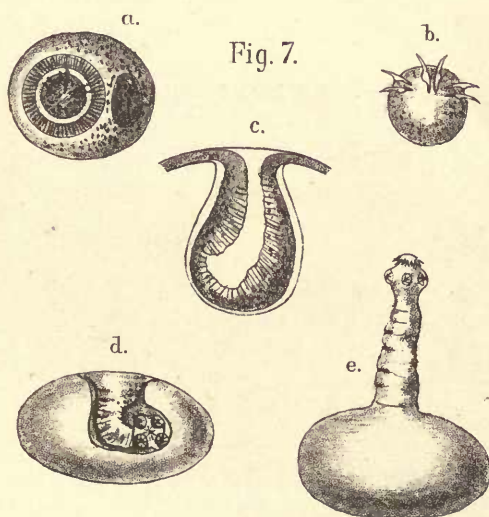


PLATE X.

Class—NEMATHELMINTHES.

NEMATODA.

Trichina spiralis.

FIG. 1.—TRICHINA : MATURE FEMALE. $\times \frac{300}{2}$.

m. mouth : *i.*, *i.* intestine : *g.* genital opening : *o.* ovary.

FIG. 2.—TRICHINA : MATURE MALE. $\times \frac{300}{2}$.

m. mouth : *a.* anus : *t.* testis.

FIG. 3.—YOUNG TRICHINÆ THAT HAVE MIGRATED INTO A MUSCLE. $\times \frac{300}{2}$.

FIG. 4.—THE SAME : DEVELOPED AND ENCYSTED. $\times \frac{300}{2}$.

FIG. 5.—TRICHINÆ : FREED FROM THE MUSCULAR FIBRES. $\times 30$.

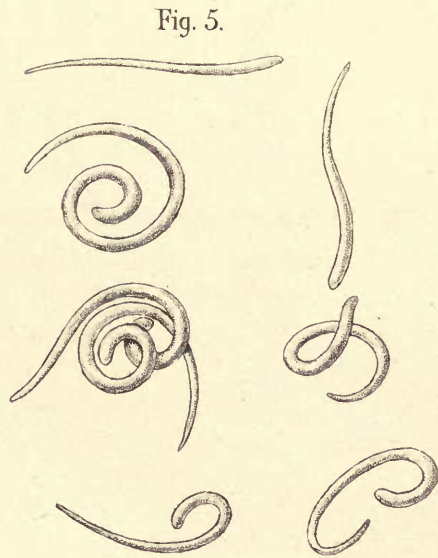
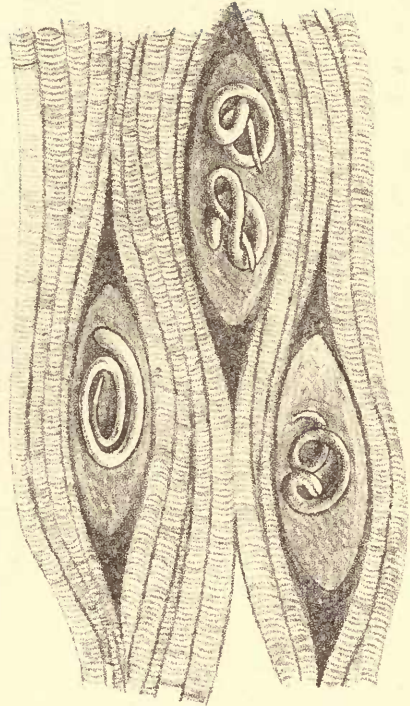
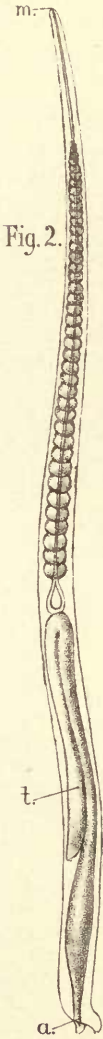


PLATE XI.

Class—NEMATHELMINTHES—*continued.*

CHÆTOGNATHA.

Sagitta.

FIG. 1.—SAGITTA (*S. bipunctata*): DORSAL VIEW. × 20.

e. eyes: *h.* hooks: *i.* intestine: *o.* ovary: *t.* testis: *s.* ejaculatory sac.

ACANTHOCEPHALA.

Echinorhynchus.

FIG. 2.—ECHINORHYNCHUS. × 1.

FIG. 3.—ANTERIOR END OF ECHINORHYNCHUS.—(After Claus.) × 2.

p. proboscis: *s.* sheath of the proboscis: *l.* lemniscus: *g.* nerve ganglion.

FIG. 4.—MALE ECHINORHYNCHUS.—(After Claus and Leuckart.) × 14.

p. proboscis: *s.* sheath of the proboscis: *g.* nerve ganglion: *l.* ligament: *t.* testes: *v.* vas deferens: *p.s.* prostatic sacs: *d.* ejaculatory duct: *pn.* penis.

Fig. 1.

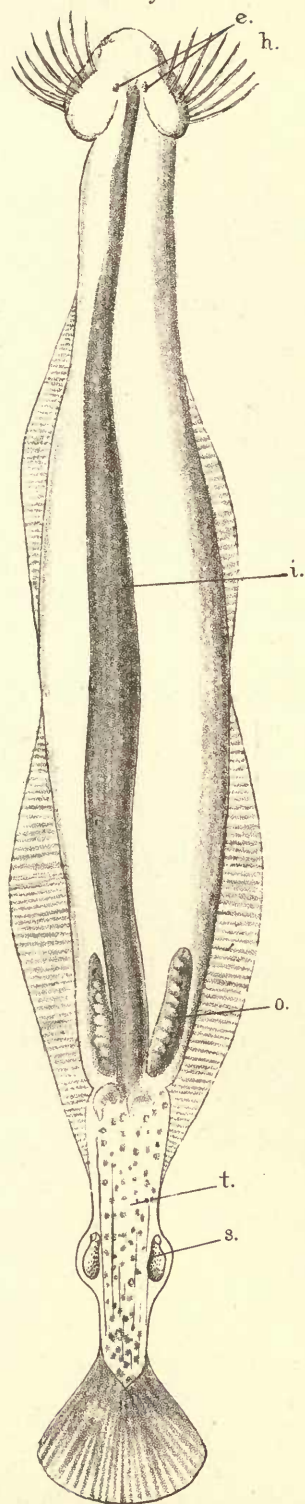


Fig. 2.

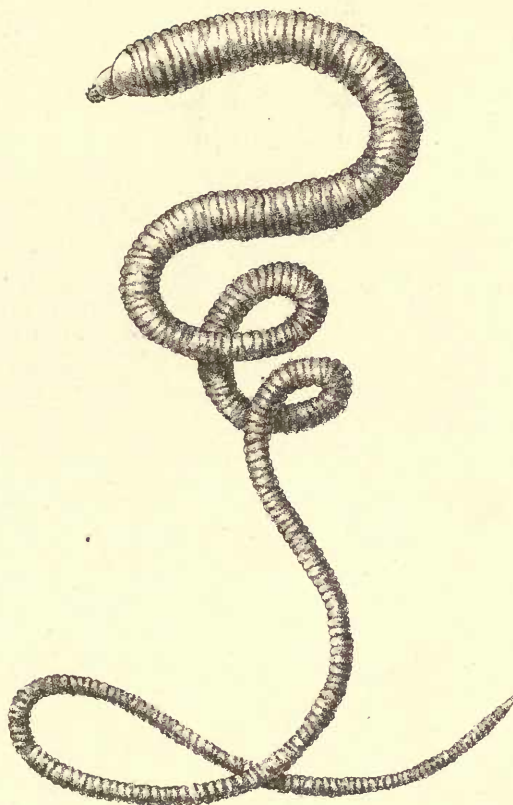


Fig. 3.

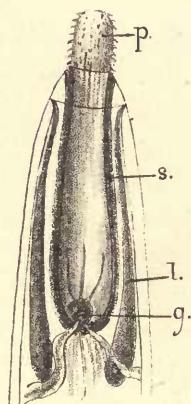


Fig. 4.

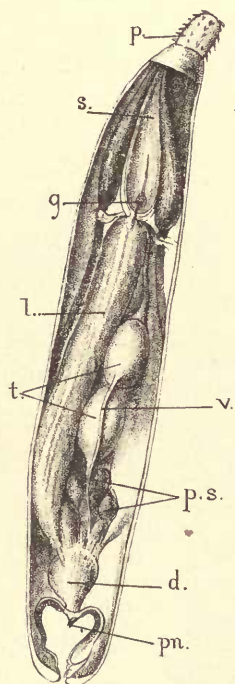


PLATE XII.

Class—ROTIFERA.

THE WHEEL-ANIMALCULE (*Rotifer vulgaris*).

FIG. 1.—ROTIFER : WITH DISC EXPANDED. $\times 400$.

d. trochal disc or wheel organ : *e.* eye : *s.* siphon : *j.* jaws with teeth :
a. c. alimentary canal with *g.* glandular mass surrounding it :
t. tube of the water vascular system : *c.* cloaca : *f.* foot portion.

FIG. 2.—ROTIFER : WITH DISC RETRACTED. $\times 400$.

m. mouth : *e.* eye : *d.* trochal disc or wheel organ : *j.* jaws with teeth :
a. c. alimentary canal with *g.* glandular mass surrounding it :
t. tube of the water vascular system : *c.* cloaca : *f.* foot portion.

Class—GEPHYREA.

Sipunculus.

FIG. 3.—SIPUNCULUS : WITH MOUTH PARTLY RETRACTED. $\times 1$.

m. position of the mouth : *r. m.* retractor muscles of the mouth :
r. nerve ring : *n.* ventral nerve cord : *i.* intestine : *a.* position
of the anus : *b., b.* "brown tubes."

Fig. 1.

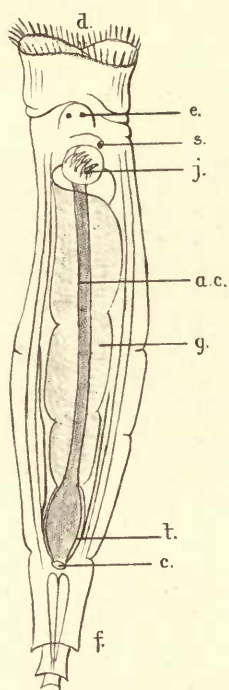


Fig. 2.

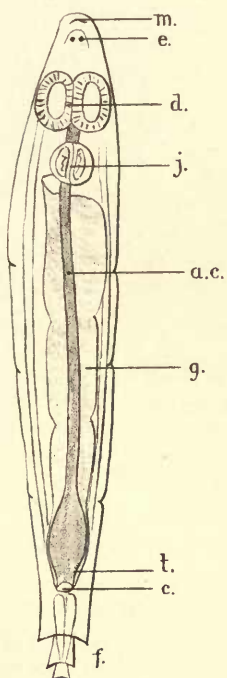


Fig. 3.

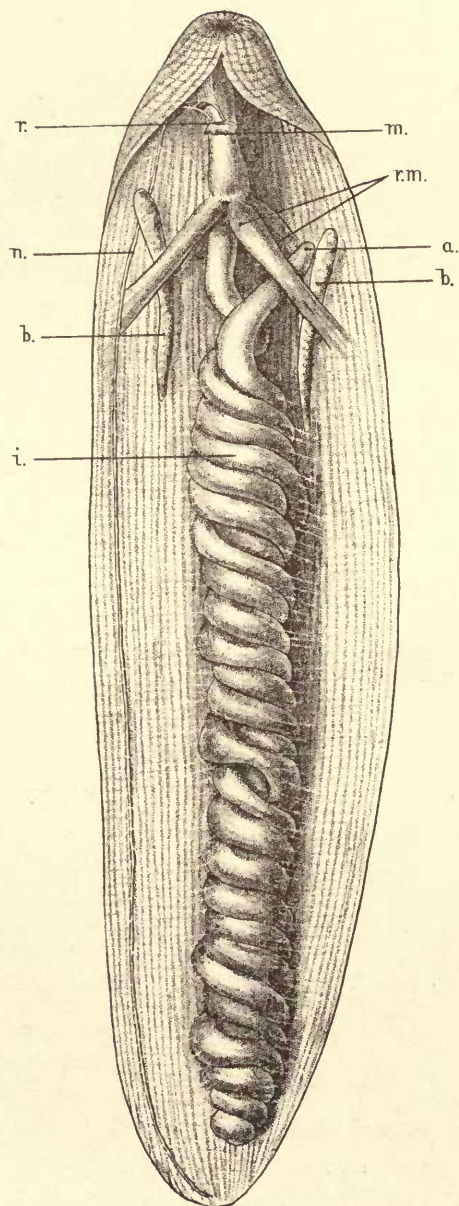


PLATE XIII.

Class—CHÆTOPODA.

THE EARTHWORM (*Lumbricus terrestris*).

FIG. 1.—ANTERIOR END: VENTRAL VIEW. $\times 2$.

p. prostomium: *m.* mouth: *s.* setæ: *s.*¹, *s.*² openings of spermatheca:
o. opening of oviduct: *v.* opening of vas deferens.

FIG. 2.—CLITELLUM: VENTRAL VIEW. $\times 2$.

FIG. 3.—POSTERIOR END: VENTRAL VIEW. $\times 2$.

FIG. 4.—DISSECTION FROM THE DORSAL ASPECT. $\times 2$.

b. buccal mass: *g.* cerebral ganglia: *p.* pharynx: *h.*¹-*h.*⁷ the seven
pairs of hearts surrounding the œsophagus: *s.* spermatheca:
s. v. seminal vesicles: *d.* dorsal blood-vessel: *c.* crop: *gd.*
gizzard: *i.* intestine covered by the "liver"

FIG. 5.—SEGMENTAL ORGAN. $\times 15$.

FIG. 6.—REPRODUCTIVE ORGANS. $\times 2$.

s. v. seminal vesicles (the position of the testes *t.* underneath the
seminal vesicles is outlined): *s.* spermatheca: *o.* ovary: *od.*
oviduct: *v.* vas deferens.

FIG. 7.—NERVOUS SYSTEM: ANTERIOR END. $\times 4$.

c. cerebral ganglia: *cm.* commissure: *g., g.* ganglia giving off nerve
cords to the segments: *n., n.* nerve cords to the septa.

FIG. 8.—TRANSVERSE SECTION THROUGH THE BODY. $\times 4$.

m. muscles of the body wall: *v.*¹ dorsal or supra-intestinal vessel:
t. typhlosole projecting into *i.* intestine: *g.* glandular tissue
—"liver": *c.* body cavity: *v.*² sub-intestinal vessel: *n.* nerve
ganglion: *s.* setæ: *v.*³ sub-neural vessel.

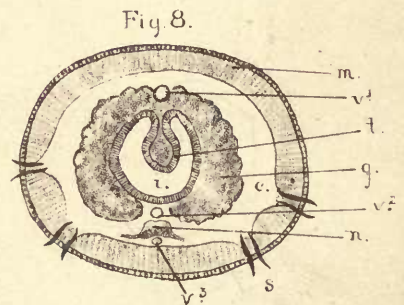
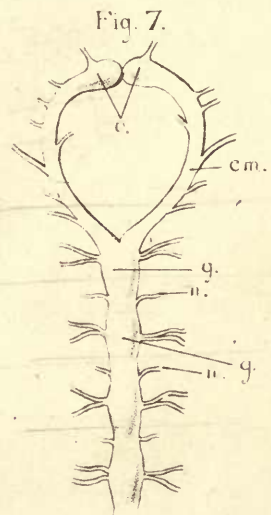
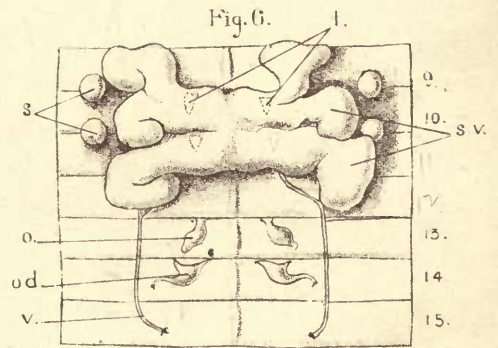
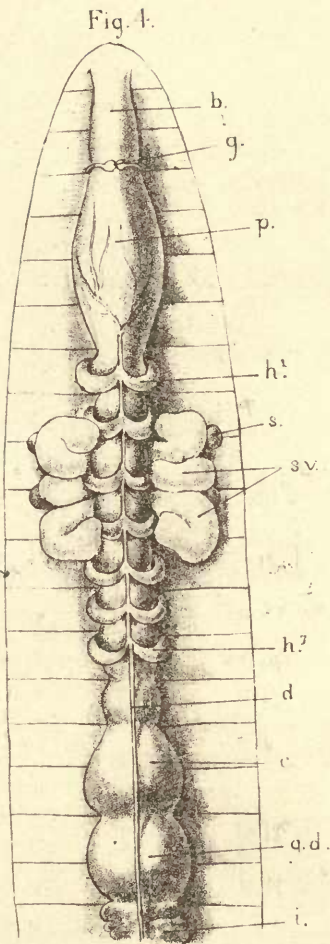
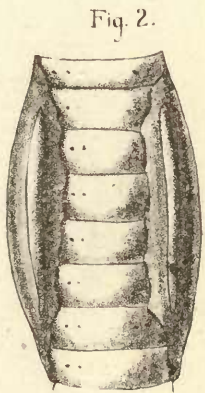
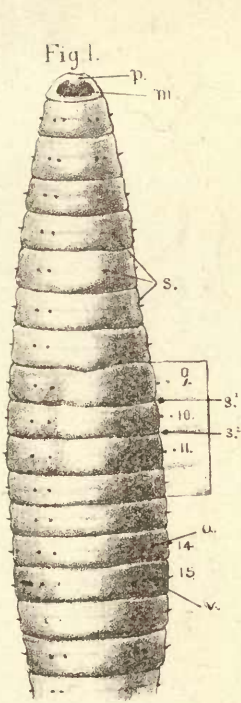


PLATE XIV.

Class—HIRUDINEA.

THE MEDICINAL LEECH (*Hirudo medicinalis*).

FIG. 1.—DISSECTION FROM THE VENTRAL ASPECT. $\times 1$.

m. mouth : *p.* penis protruded : *v.* external opening of the vagina : *s.*¹-*s.*¹⁷ segmental organs : *c.*¹-*c.*¹¹ caeca or diverticula of the stomach : *s. v.* seminal vesicle : *o.* ovary : *t.*¹-*t.*⁹ testes : *v. d.* vas deferens : *v. e.* vas efferens : *i.* intestine : *g.* nerve ganglion on the ventral cord : *p. s.* posterior sucker.

FIG. 2.—DISSECTION FROM THE LEFT SIDE. $\times 1$.

m. mouth : *g.* supra-oesophageal nerve ganglia, or brain : *r.* circum-oesophageal nerve ring : *v.* ventral nerve cord with ganglia : *s.*¹-*s.*¹⁷ segmental organs : *c.*¹-*c.*¹¹ caeca or diverticula of the stomach : *i.* intestine : *a.* anus.

FIG. 3.—HEAD REGION : VENTRAL ASPECT : SHOWING THE JAWS. $\times 3$.

FIG. 4.—ONE OF THE JAWS REMOVED. $\times 15$.

FIG. 5.—TRANSVERSE SECTION THROUGH THE BODY. $\times 6$.

m. muscular layers : *d.* dorsal vessel : *l.* lateral vessel : *s.s.* vesicle of the segmental organ : *t.* testis : *v.* ventral vessel enclosing the nerve cord : *s.* stomach.

FIG. 6.—HEAD REGION : DORSAL ASPECT : SHOWING THE POSITION OF THE EYES.
 $\times 3$.

Fig. I.

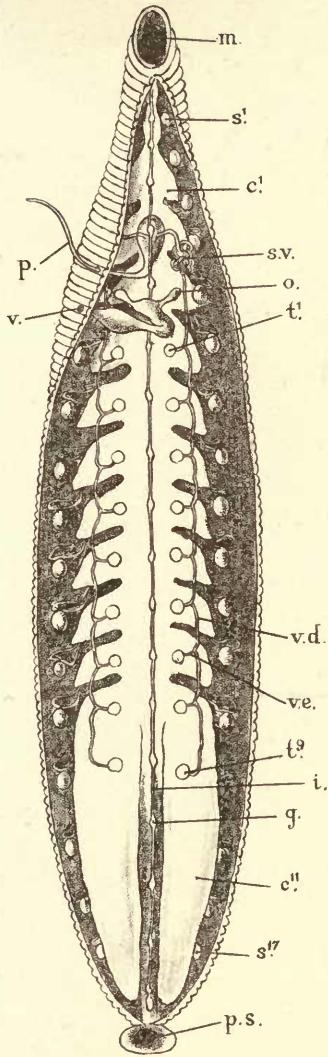


Fig. 2.

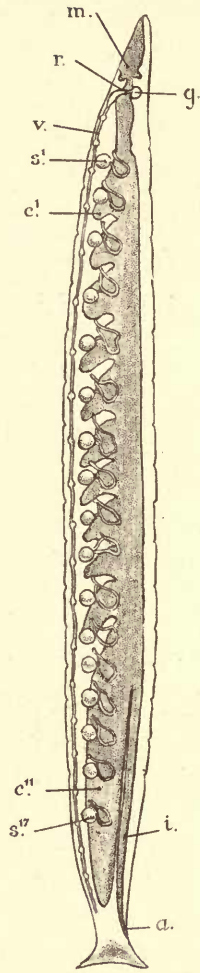


Fig. 3.



Fig. 4.

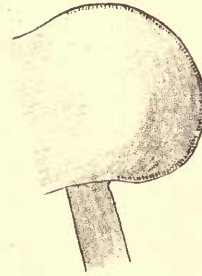


Fig. 6.

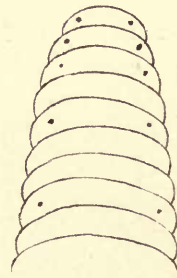


Fig. 5.

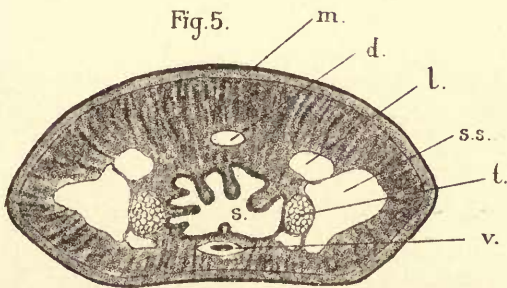


PLATE XV.

Class—MYZOSTOMEA.

Myzostoma.

FIGS. 1, 2.—CYSTS ON THE ARMS OF CRINOIDS CONTAINING MYZOSTOMIDA.—
(After von Graff) $\times 1$.

FIG. 3.—MYZOSTOMA : VENTRAL ASPECT. $\times \frac{50}{3}$.

FIG. 4.—MYZOSTOMA : DORSAL ASPECT. $\times \frac{50}{3}$.

FIG. 5.—A DIAGRAM TO REPRESENT THE ORGANISATION OF MYZOSTOMA.—(From
Sutton, modified from von Graff)

p. proboscis; *i.* branched intestine: *t.* testis: *o.* ovary: *r.* rectum:
c. cloaca: *s.*¹-*s.*⁴ suckers: *p.*¹-*p.*⁵ parapodia.

Fig. 1.



Fig. 2.



Fig. 5.

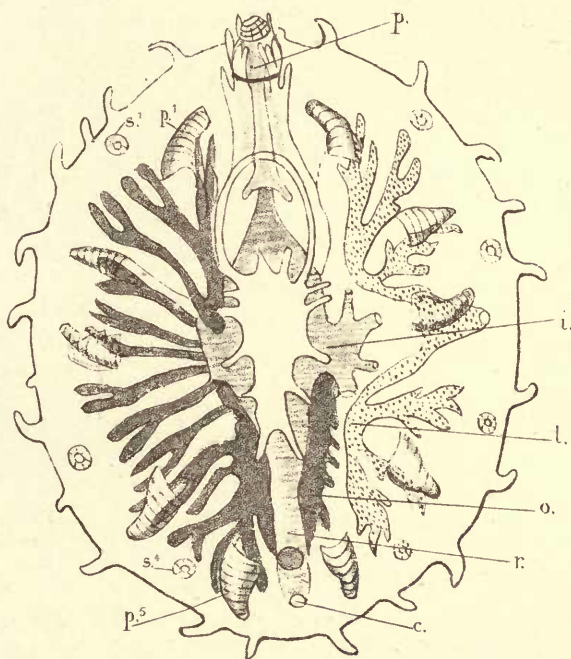


Fig. 3.

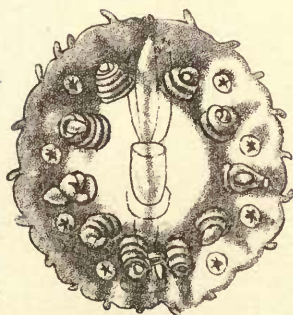
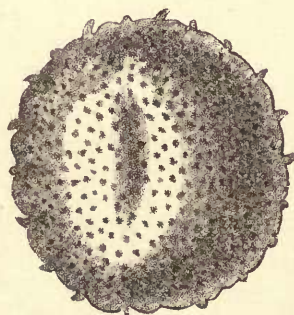


Fig. 4.



Class—MOLLUSCA.

LAMELLIBRANCHIATA.

THE FRESH-WATER MUSSEL (*Anodon*).

FIG. 1.—VALVES OF THE SHELL. $\times \frac{1}{2}$.

a. anterior end: *p.* posterior end: *h.* hinge on the dorsal aspect:
*m.*¹, *m.*² position of the anterior and posterior adductor
muscles: *u.* umbo.

FIG. 2.—VIEW ON REMOVAL OF PART OF THE MANTLE. THE DOTTED LINE SHOWS
WHERE THE MANTLE HAS BEEN CUT. $\times \frac{1}{2}$.

v. right valve laid up: *h.* position of the heart: *g.* gills on the right
side: *a. a.* anterior adductor muscle: *a. f.* anterior foot-
retractor: *f. p.* foot-protractor: *m.* mouth: *p.* labial palps:
f. foot: *ma.* mantle: *b.* branchial siphon: *a.* anal siphon:
p. a. posterior adductor muscle: *p. f.* posterior foot-retractor.

FIG. 3.—DISSECTION SHOWING THE OPENINGS OF THE GENITAL GLAND AND THE
ORGAN OF BOJANUS. $\times \frac{1}{2}$.

*g.*¹, *g.*² gills on the right and left sides: *m.* mantle: *f.* foot: *p.* labial
palps: *a.* anterior adductor muscle: *b.*¹ bristle in the opening
of the organ of Bojanus: *b.*² bristle in the opening of the
genital gland.

FIG. 4.—POSTERIOR VIEW. $\times \frac{2}{3}$.

a. anal siphon: *b.* branchial siphon.

FIGS. 5, 6, 7.—HEART AND RECTUM. $\times 1$.

a. right auricle: *v.* ventricle: *b.* bristle in the opening of the organ
of Bojanus into the pericardium: *a.*¹ anterior aorta: *a.*²
posterior aorta: *r.* rectum: *o.* openings from the auricles into
the ventricle.

FIG. 8.—DIAGRAM OF THE ORGAN OF BOJANUS.

m. posterior adductor muscle: *p.* pericardium: *v.* ventricle: *i.*
internal opening of the organ: *e.* external opening of the
organ: *g.* genital opening: *k.* "kidney" or glandular portion
of the organ: *n.* non-glandular portion.

FIG. 9.—DISSECTION FROM THE LEFT SIDE: PARTLY DIAGRAMMATIC: TO SHOW
THE ALIMENTARY SYSTEM. $\times \frac{1}{2}$.

f. foot: *g.* gills: *m.* mouth: *s.* stomach surrounded by the "liver":
i. coils of intestine: *p.* pericardial sac: *r.* rectum.

FIG. 10.—NERVOUS SYSTEM. $\times \frac{1}{2}$.

p. s. parieto-splanchnic ganglia: *c.* cerebral ganglion on the right side:
p. pedal ganglia: *c. s.* commissure: *a.* anus: *g.* gills.

Fig. 1.

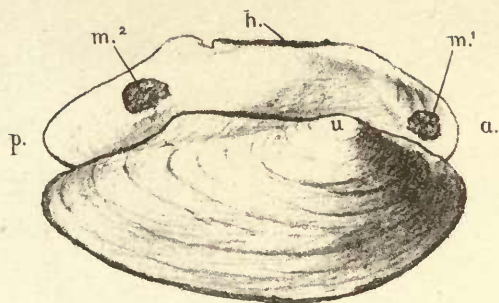


Fig. 2.

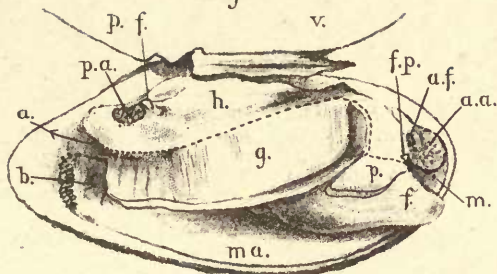


Fig. 3.

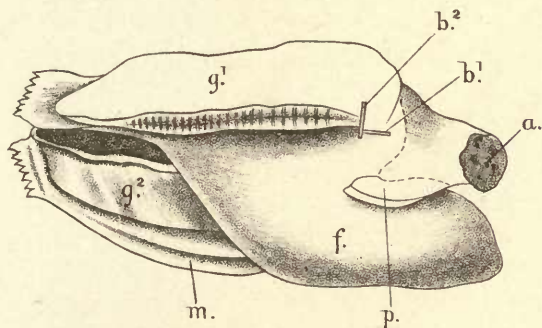


Fig. 4.

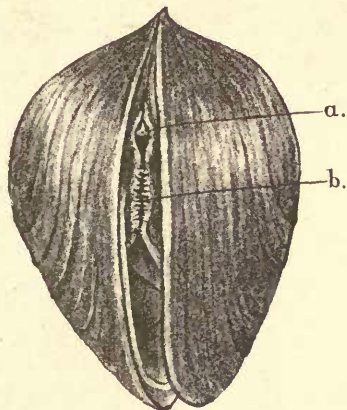


Fig. 5.



Fig. 6.

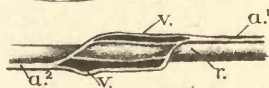


Fig. 7.

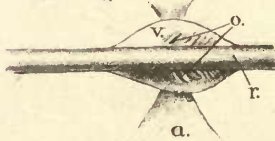


Fig. 8.

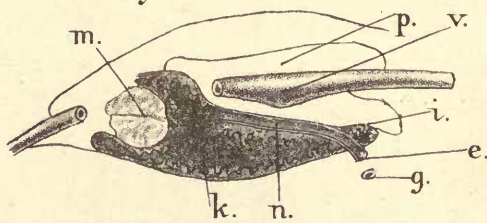


Fig. 9.

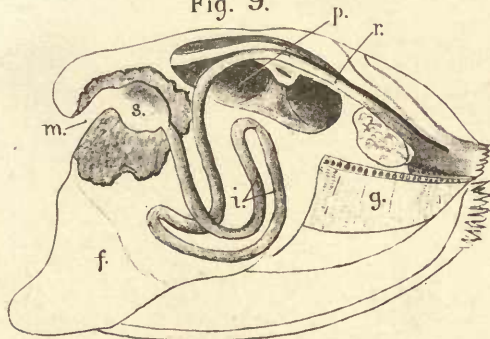


Fig. 10.

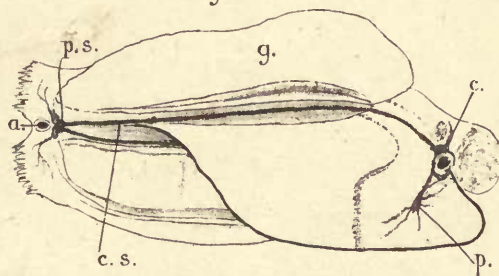


PLATE XVII.

Class—MOLLUSCA—*continued.*

ODONTOPHORA.

THE EDIBLE SNAIL (*Helix pomatia*.)

FIG. 1.—SNAIL: EXTENDED. $\times 1$.

f. foot: *l.* lip: *c.* eye upon *t.* one of the long tentacles: *g.* genital opening: *p.* pulmonary opening.

FIG. 2.—SNAIL: CONTRACTED, WITH SHELL REMOVED. $\times 1$.

f. foot: *c.* collar: *p.* portion of the pulmonary chamber: *r.* position of the reproductive organs, *l.* of the liver, *a.* of the albumen gland.

FIG. 3.—DISSECTION FROM THE LEFT SIDE. $\times 1$.

b. buccal mass: *o.* œsophagus: *m.* muscle of the tentacle: *c. g.* cerebral ganglia: *p. g.* parieto splanchnic and pedal ganglia: *s. g.* left salivary gland sending forwards its duct to the buccal mass: *c.* crop: *g.* genital gland: *l.* tri-lobed liver: *i.* intestine: *p.* pulmonary vein from the lung: *k.* kidney: *a.* auricle: *v.* ventricle.

FIG. 4.—REPRODUCTIVE SYSTEM. $\times 1$.

g. hermaphrodite gland: *d.* its duct: *a.* albumen gland: *o., o.* oviduct: *v., v.* vas deferens: *p.* penis: *f.* flagellum: *m.* retractor muscle of the penis: *s.* spermatheca: *d. s.* dart sac: *m. g.* mucous glands: *v.* vagina.

FIG. 5.—LONGITUDINAL SECTION THROUGH THE BUCCAL MASS. $\times 2$.

m. mouth: *b.* buccal cavity: *r., r.* radula: *c.* cartilage: *o.* œsophagus: *g.* gland of the foot.

FIG. 6.—RADULA. $\times 3$.

FIG. 7.—PART OF THE RADULA, SHOWING THE TEETH. $\times \frac{300}{8}$.

Fig.1.

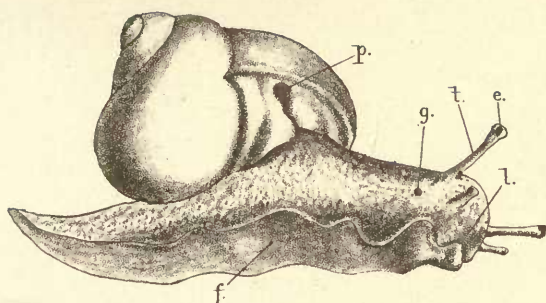


Fig. 2.

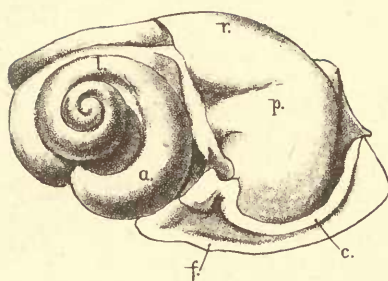


Fig. 3.

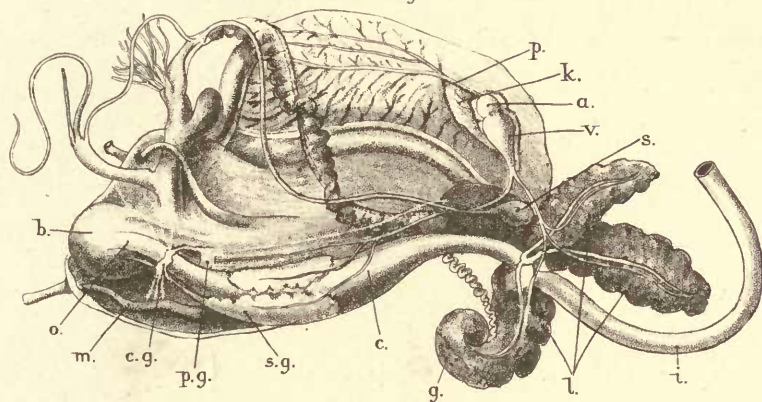


Fig. 5.

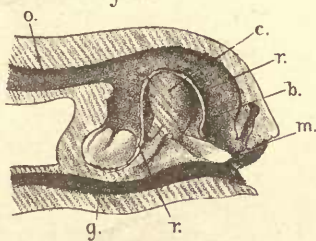


Fig. 7.

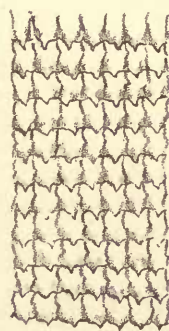


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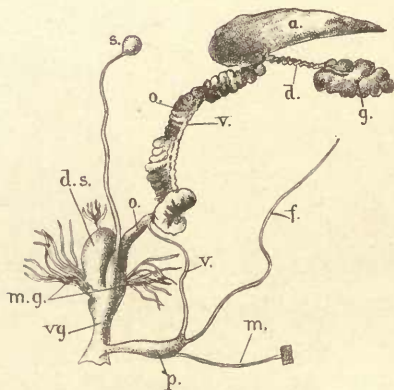


Fig. 6.



PLATE XVIII.

Class—POLYZOA.

Bugula.

FIG. 1.—DIAGRAM OF A POLYZOON.—(After Busk.)

t. tentacles: *l.* lophophore: *m.* mouth: *o.* œsophagus: *s.* stomach:
i. intestine: *a.* anus: *g.* nerve ganglion: *f.* funiculus.

FIG. 2.—BUGULA PLUMOSA. × 1.

FIG. 3.—ZOECEIA OF BUGULA: FRONT VIEW. × 10.

z. zoœcium: *a.* the avicularium.

FIG. 4.—ZOECEIA OF BUGULA: BACK VIEW. × 10.

FIG. 5.—THE AVICULARIUM. × 50.

Membranipora.

FIG. 6.—ZOECEIA OF *Membranipora membranacea*. × 1½.

FIG. 7.—THE SAME. × 25.

Class—BRACHIOPODA.

Lingula.

FIG. 8.—LINGULA. × 1.

FIG. 9.—LINGULA: VIEW AFTER REMOVING THE VENTRAL VALVE AND PART OF
THE MOUTH. × 1.

c. capsule of the pedicle: *p. a.* posterior adductor muscle: *p.* posterior
adjuster muscles: *a.* anterior retractor muscle: *l.* liver:
c. a. central adjuster muscles.

Fig. 1.

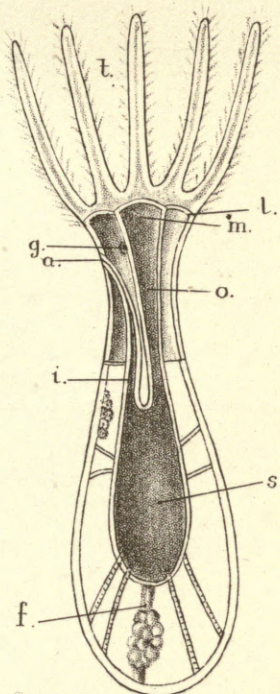


Fig. 2.



Fig. 3.

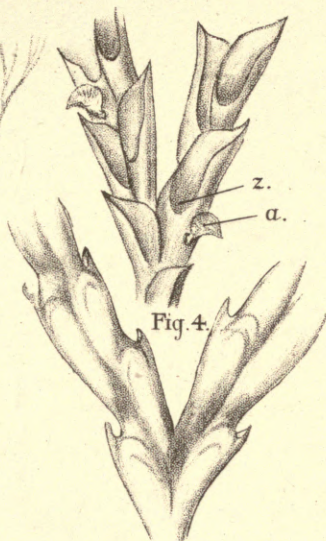


Fig. 4.

Fig. 5.

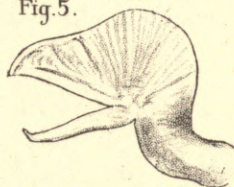


Fig. 6.



Fig. 7.

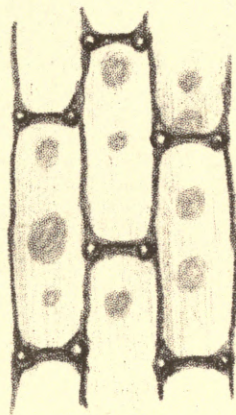


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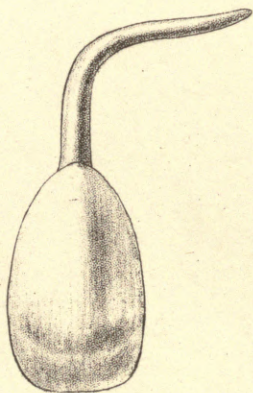


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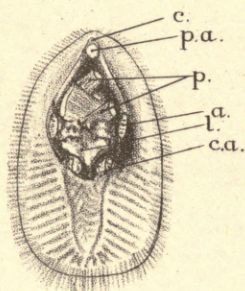


PLATE XIX.

Class—CRUSTACEA.

THE LOBSTER (*Homarus vulgaris*).

FIG. 1.—DORSAL SURFACE : APPENDAGES REMOVED. $\times \frac{1}{2}$.

r. rostrum : *c. s.* cephalo-thoracic shield : *b.* branchiostegite : *s.*¹, *s.*⁶
segments of the abdomen : *t.* telson.

FIG. 2.—VENTRAL SURFACE. $\times \frac{1}{2}$.

m. mouth : *g.* genital openings (male) : *a.* anus.

FIG. 3.—DISSECTION FROM THE DORSAL ASPECT. $\times \frac{1}{2}$.

s. stomach : *r.* reproductive organs : *l., l.* liver : *m.* muscles of the
abdomen : *h.* position of the heart.

Fig. 1.

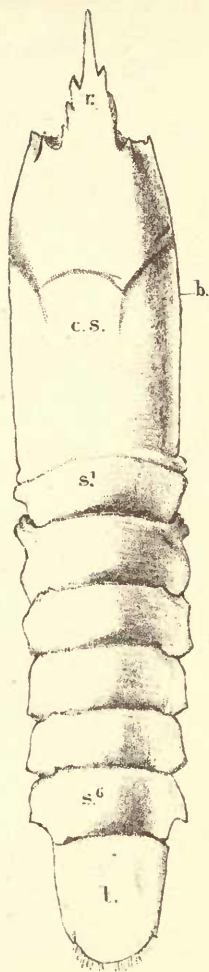


Fig. 2.

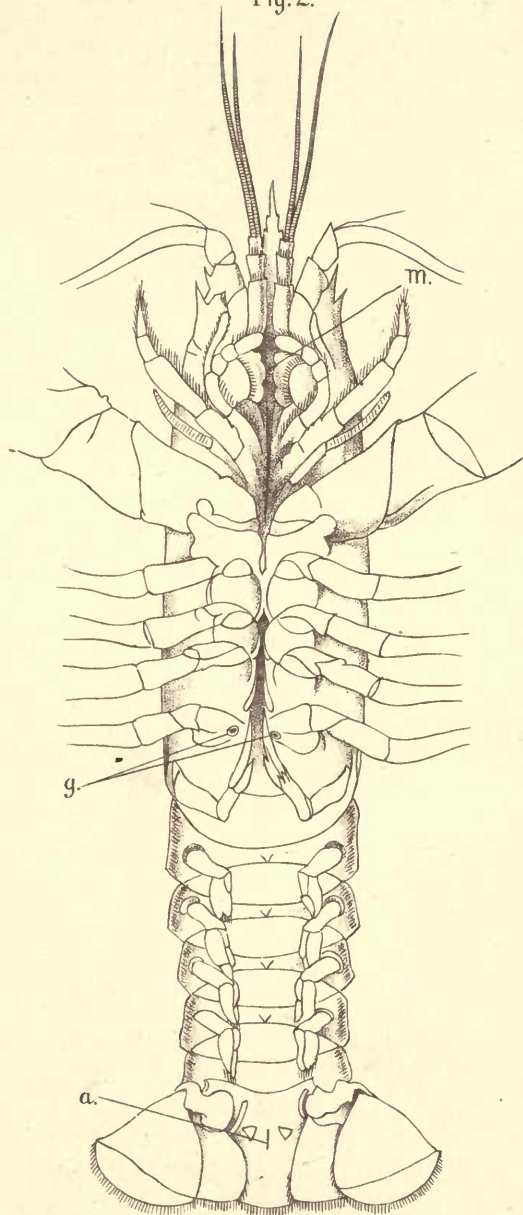


Fig. 3.

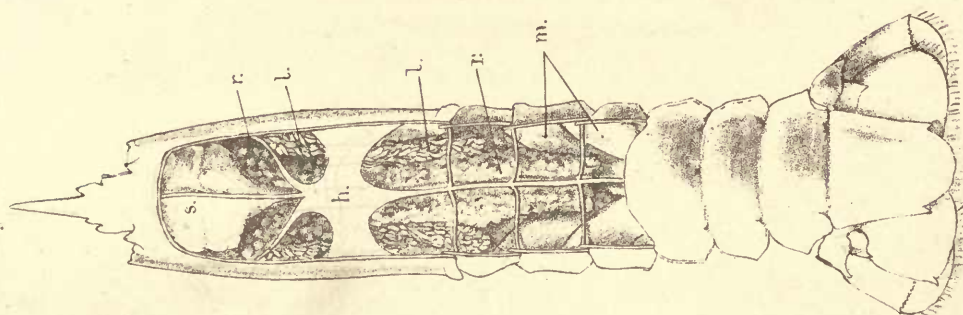


PLATE XX.

Class—CRUSTACEA—*continued.*

THE LOBSTER—*continued.*

APPENDAGES DISARTICULATED.

FIG. 1.—ANTENNULE. $\times 1$.

FIG. 2.—ANTENNA. $\times 1$.

FIG. 3.—MANDIBLE: with *p.* palp. $\times 1$.

FIG. 4.—FIRST MAXILLA. $\times 1$.

FIG. 5.—SECOND MAXILLA: with *s.* scaphognathite. $\times 1$.

FIG. 6.—FIRST MAXILLIPED. $\times 1$.

FIG. 7.—SECOND MAXILLIPED. $\times 1$.

FIG. 8.—THIRD MAXILLIPED: with *p.* podobranchia, and *e.* epipodite. $\times 1$.

FIG. 9.—LARGE CHELA. $\times \frac{1}{2}$.

FIG. 10.—FIRST WALKING LEG, CHELATE. $\times 1$.

Note.—The numbers of the figures (1-10) correspond to the numbers of the segments to which the various appendages belong.

Fig. 1.

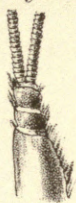


Fig. 2.



Fig. 3.

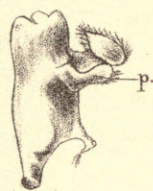


Fig. 5.

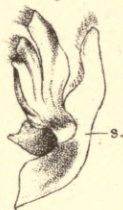


Fig. 4.



Fig. 6.

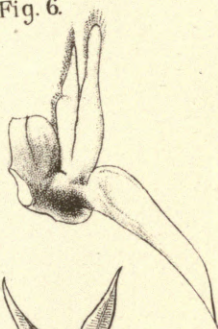


Fig. 7.

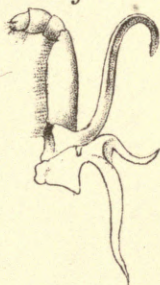


Fig. 8.

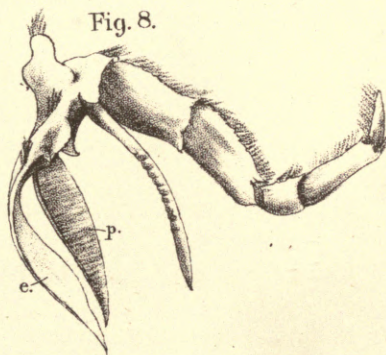


Fig. 9.

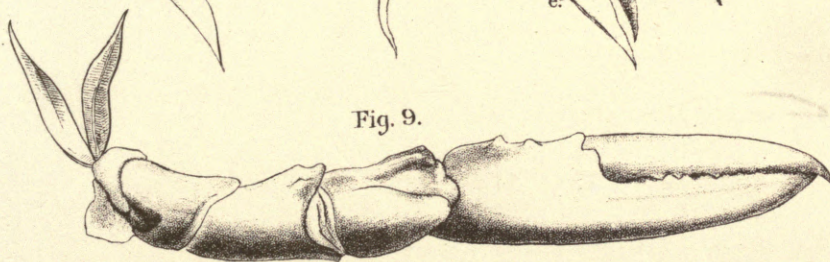


Fig. 10.

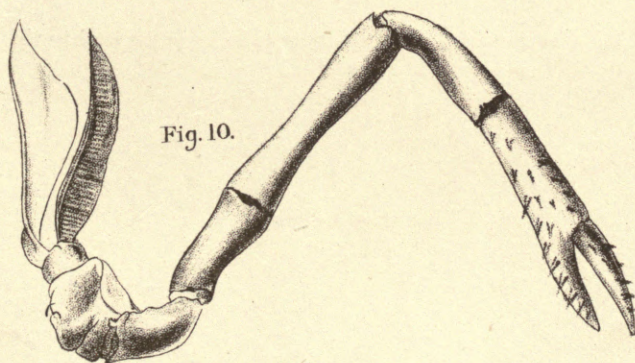


PLATE XXI.

Class—CRUSTACEA—*continued.*

THE LOBSTER—*continued.*

APPENDAGES DISARTICULATED—*continued.*

FIG. 11.—SECOND WALKING LEG, CHELATE. $\times 1$.

FIG. 12.—THIRD WALKING LEG, NON-CHELATE. $\times 1$.

FIG. 13.—FOURTH WALKING LEG, NON-CHELATE. $\times 1$.

FIG. 14.—FIRST SWIMMERET: *m.* of male; *f.* of female. $\times 1$.

FIG. 15.—SECOND SWIMMERET: *m.* of male; *f.* of female. $\times 1$.

FIG. 16.—THIRD SWIMMERET. $\times 1$.

FIG. 17.—FOURTH SWIMMERET. $\times 1$.

FIG. 18.—FIFTH SWIMMERET. $\times 1$.

FIG. 19.—SIXTH SWIMMERET, WITH JOINTED EXOPODITE. $\times 1$.

Note.—The numbers of the figures (11-19) correspond to the numbers of the segments to which the various appendages belong.

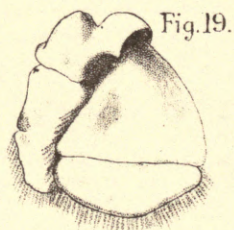
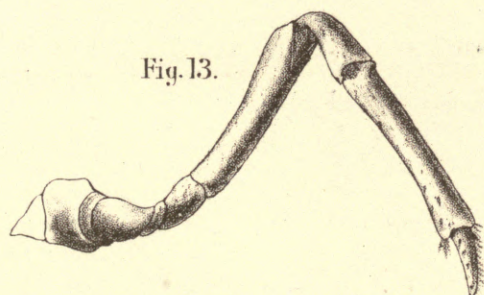
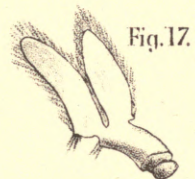
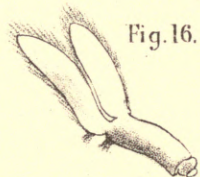
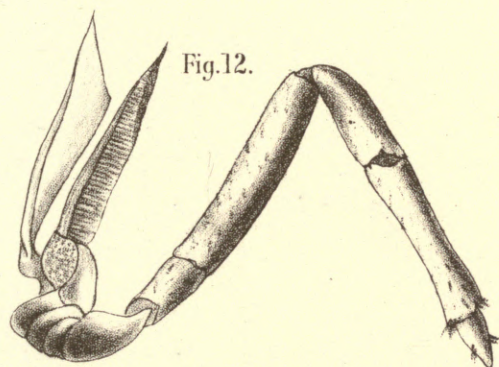
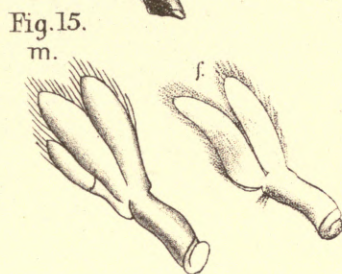
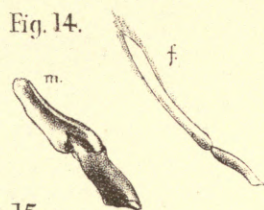
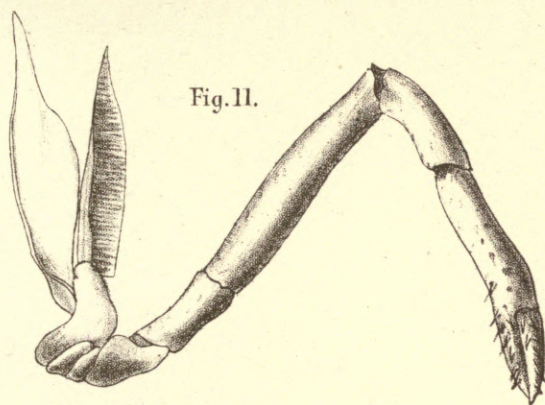


PLATE XXII.

Class—CRUSTACEA—*continued.*

THE LOBSTER—*continued.*

FIG. 1.—LONGITUDINAL SECTION, SOMEWHAT TO THE LEFT OF THE MIDDLE LINE.

$\times \frac{1}{2}$.

æ. œsophagus: *m.* muscles of the stomach: *h.* heart: *o. a.* ophthalmic artery: *s. a.* superior abdominal artery: *s.* sternal artery: *i. a.* inferior abdominal artery: *n.* nerve cord: *i.* intestine: *g.* genital opening (male).

FIG. 2.—PLAN OF THE CIRCULATORY SYSTEM.

h. heart: *s. a.* superior abdominal artery: *st.* sternal artery: *i. a.* inferior abdominal artery: *s.* venous sinus sending afferent vessels to the gills. (The efferent vessels from the gills to the pericardial sinus are represented by the six dark lines.)

FIGS. 3, 4, 5.—DORSAL, VENTRAL, AND SIDE VIEWS OF THE HEART. $\times 1$.

o. a. ophthalmic artery: *a.* antennary artery: *h.* hepatic artery: *s. a.* superior abdominal artery: *st.* sternal artery: *o.* openings into the heart.

FIG. 6.—VENTRAL VIEW OF THE BLOOD SINUS AT THE BASE OF THE GILLS. $\times \frac{1}{2}$.

s. sinus receiving vessels from the appendages.

Fig. 1.

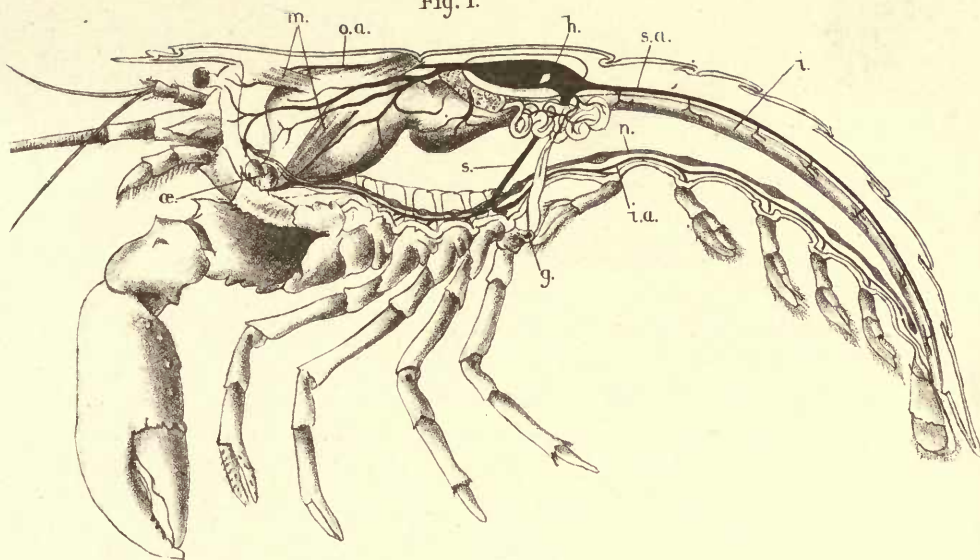


Fig. 2.

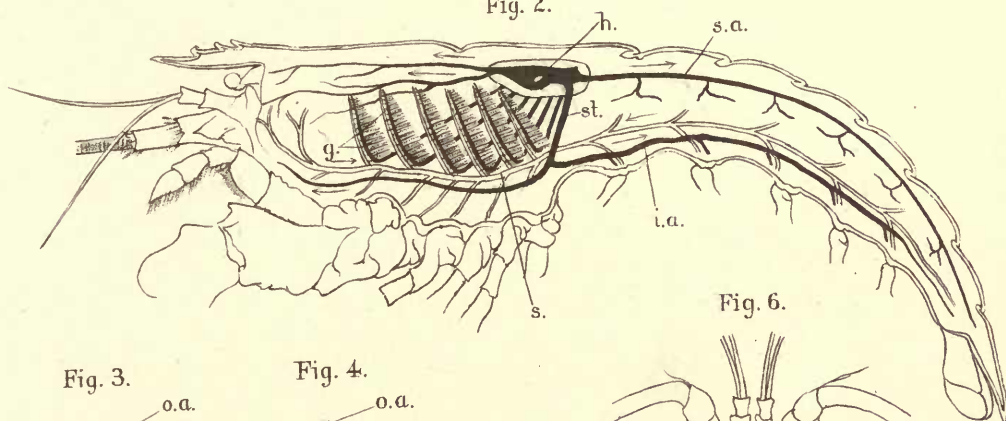


Fig. 3.

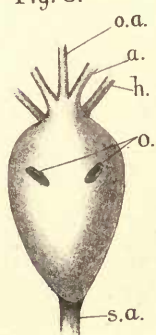


Fig. 4.

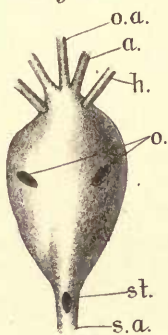


Fig. 6.

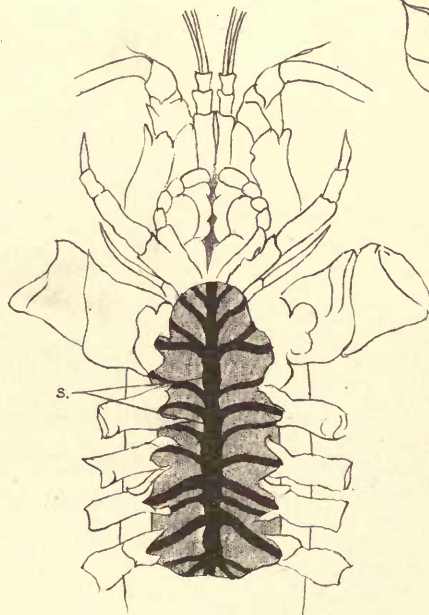


Fig. 5.

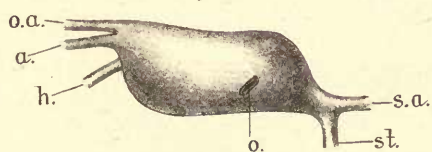


PLATE XXIII.

Class—CRUSTACEA—*continued.*

THE LOBSTER—*continued.*

FIG. 1.—EYE, EAR, AND GREEN GLAND. $\times 1$.

r. rostrum: *e.* eye: *a. o.* auditory opening on the basal joint of the antennule: *a.* antenna: *b.* bristle passed into the opening of the green gland: *g.* green gland: *s.* its sac.

FIG. 2.—MOUTH PARTS. $\times 1$.

mn. mandible: *p.* palp: *t.* tendon: *m.* mouth: *l.* labrum: *ms.* metastoma.

FIG. 3.—STOMACH OPENED FROM ABOVE. $\times 1$.

o. gastric ossicles.

FIG. 4.—FOURTH ABDOMINAL SOMITE: POSTERIOR VIEW. $\times \frac{1}{2}$.

t. tergum: *p.* pleuron: *s.* sternum: *pr.* protopodite: *ex.* exopodite: *en.* endopodite. (The portion, scarcely distinguishable in this segment, between the base of the protopodite and the pleuron is the epimeron.)

FIG. 5.—THIRD MAXILLIPED. $\times 1$.

p. protopodite: *en.* endopodite: *ex.* exopodite: *g.* gill: *ep.* epipodite: *i.* ischiopodite: *m.* meropodite: *c.* carpopodite: *p.* propodite: *d.* dactylopodite.

FIG. 6.—GILLS EXPOSED BY REMOVAL OF THE BRANCHIOSTEGITE. $\times 1$.

g. gills: *e.* epipodite.

FIG. 7.—TRANSVERSE SECTION OF THE THORAX, TO ILLUSTRATE THE RESPIRATORY CIRCULATION. $\times 1$.

l. leg: *v. s.* venous sinus: *g.* gill: *a.* afferent branchial vessel: *e.* efferent branchial vessel: *s.* sternal artery.

Fig. 1.

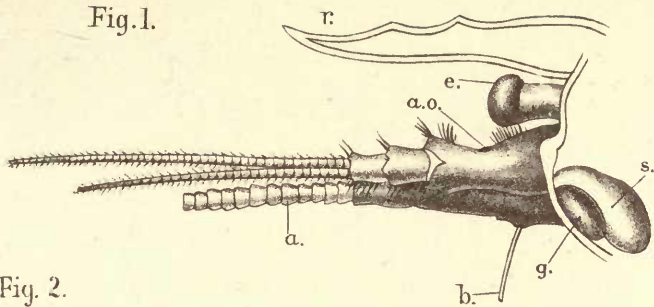


Fig. 2.

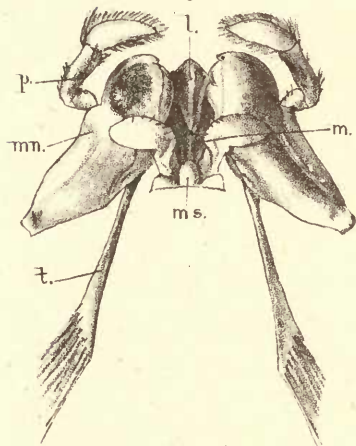


Fig. 3.

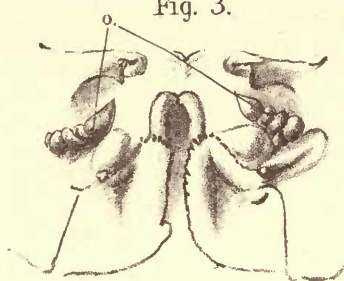


Fig. 4.

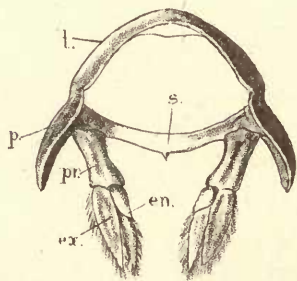


Fig. 5.

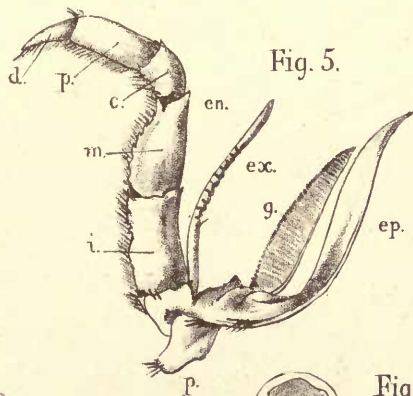


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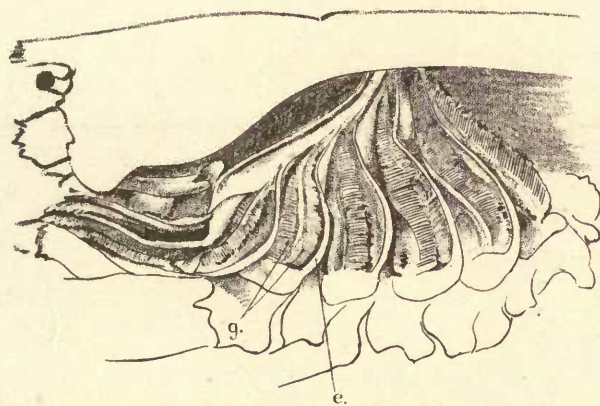
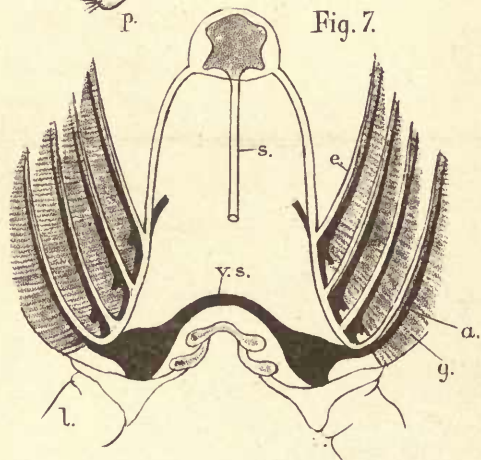


Fig. 7.



Class—TRACHEATA.

INSECTA.

THE COCKROACH (*Periplaneta (Blatta) orientalis*).

FIG. 1.—MALE. $\times 1\frac{1}{2}$.

FIG. 2.—FEMALE. $\times 1\frac{1}{2}$.

FIG. 3.—YOUNG. $\times 1\frac{1}{2}$.

FIG. 4.—VENTRAL VIEW. $\times 1\frac{1}{2}$.

FIG. 5.—HEAD: ANTERIOR VIEW. $\times 6$.

eg. epicranial suture: *w.* white spot (fenestra): *an.* antenna: *e.* eye:
c. clypeus.

FIG. 6.—HEAD: POSTERIOR VIEW. $\times 6$.

t. tracheæ: *o.* oesophagus: *n.* nerve cord: *s.* salivary duct: *s. m.* sub-
mentum: *m.* mentum: *l.* ligula: *p.* paraglossa.

FIG. 7.—HEAD, WITH UPPER LIP AND UPPER JAWS: ANTERIOR VIEW. $\times 6$.

l. labrum: *m.* mandible.

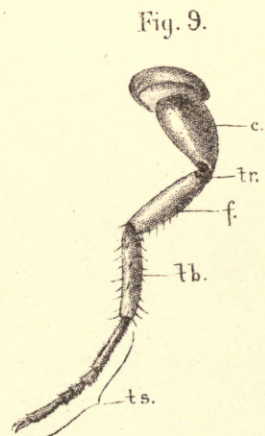
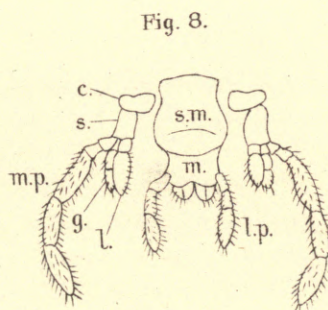
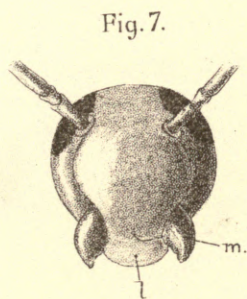
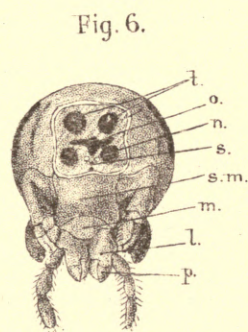
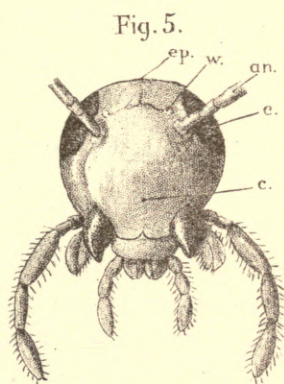
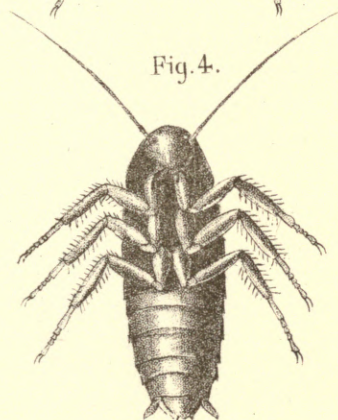
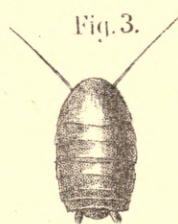
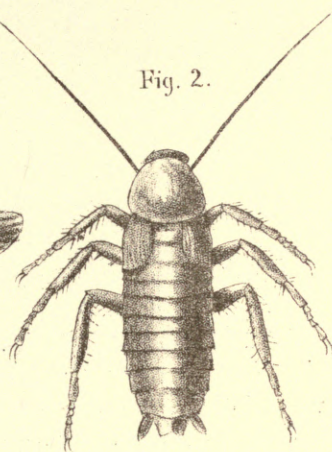
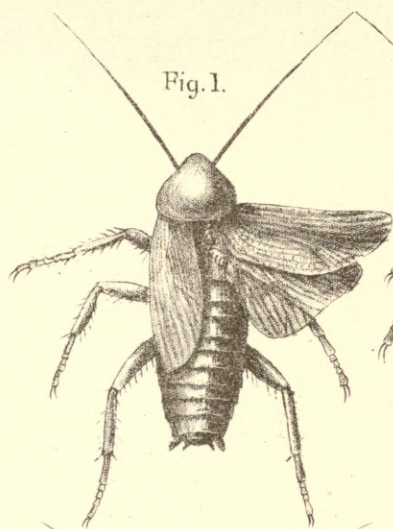
FIG. 8.—LOWER LIP AND LOWER JAWS. $\times 6$.

s. m. sub-mentum: *m.* mentum: *l. p.* labial palp. (These parts con-
stitute the labium.)

c. cardo: *s.* stapes: *l.* lacinea: *g.* galea: *m. p.* maxillary palp. (These
constitute the maxilla.)

FIG. 9 —LEG. $\times 3$.

c. coxa: *tr.* trochanter: *f.* femur: *tb.* tibia: *ts.* tarsus.



Class—TRACHEATA—*continued*.

ARACHNIDA.

THE SCORPION (*Scorpio*).

FIG. 1.—VENTRAL VIEW. $\times 1$

c. chelicerae: *p.* pedipalpi: *l.*¹-*l.*⁴ walking legs (These six pairs of appendages belong to the segments of the cephalo-thorax): *g.* genital operculum covering the genital opening, on the first segment of the præ-abdomen: *p.* pectine, on the second segment of the præ-abdomen: *s.*²-*s.*⁴ stigmata on the fourth to the sixth segments of the præ-abdomen (The stigmata on the third segment are concealed by the pectines): *p.*⁷ seventh segment of the præ-abdomen: *p. a.*¹-*p. a.*⁷ the six segments of the post-abdomen: *sp.* poison spine.

FIG. 2.—DORSAL VIEW. $\times 1$.

c. chelicerae: *c. t.* cephalo-thoracic shield; *a.*¹-*a.*⁷ segments of the præ-abdomen.

FIG. 3.—LARGE CLAW. $\times 1$.

FIG. 4.—PECTINE DETACHED. $\times 2$.

FIG. 5.—HEAD REGION: DORSAL ASPECT. $\times 1\frac{1}{2}$.

c. chelicerae: *c. t.* cephalo-thoracic shield: *m. e.* marginal eyes: *e.* eyes on the middle of the shield.

FIG. 6.—LUNG SACS: VIEW FROM BEHIND. $\times 1$.

*p.*³-*p.*⁶ third to sixth segments of the præ-abdomen with the lung sacs: *p.*⁷ seventh segment of the præ-abdomen.

FIG. 7.—LUNG SAC ENLARGED. $\times 6$.

s. stigma: *l.* lamellæ composing the lung-book.

Fig. 1.

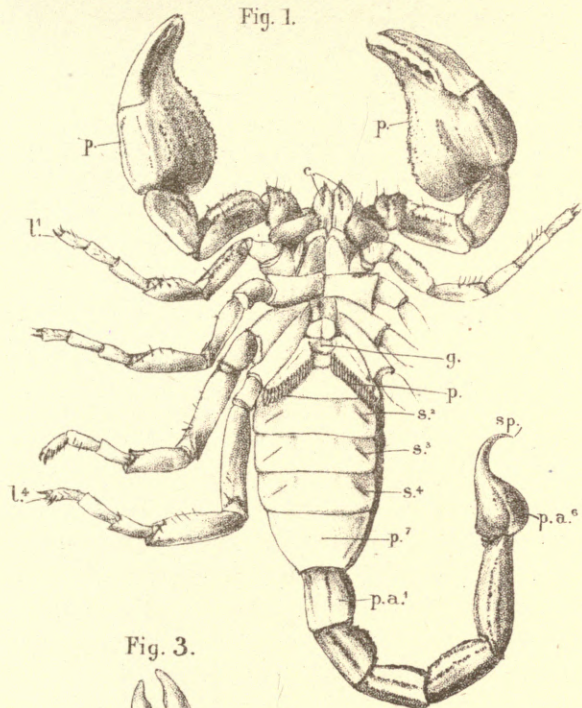


Fig. 2.

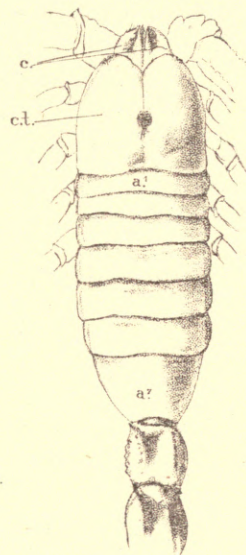


Fig. 3.



Fig. 6.

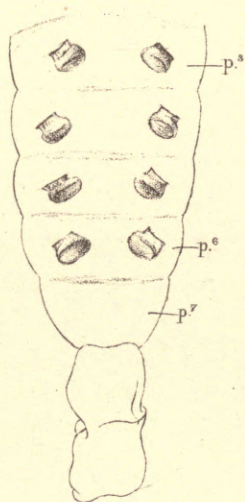


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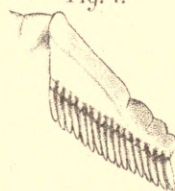


Fig. 5.

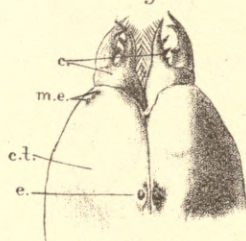


Fig. 7.

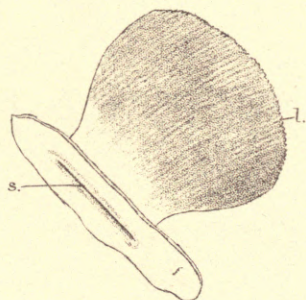


PLATE XXVI.

Class—PÆCILOPODA.

THE KING CRAB (*Limulus*).

FIG. 1.—LIMULUS : VENTRAL VIEW. $\times \frac{1}{2}$.

a. "antenna": *c.* cephalo-thoracic shield: *ab.* abdomen: *t.* caudal spine or "telson": *o.* operculum: *p.* plates bearing gills.

FIG. 2.—LIMULUS : DORSAL VIEW. $\times \frac{1}{2}$.

*e.*¹ compound eye: *e.*² simple eye.

Class—PYCNOGONIDÆ.

THE NOBODY CRAB (*Pycnogonum*).

FIG. 3.—PYCNOGONUM : DORSAL VIEW. $\times 3$.

Class—LINGUATULIDÆ.

Pentastomum.

FIG. 4.—PENTASTOMUM. $\times 10$.

Fig. 1.

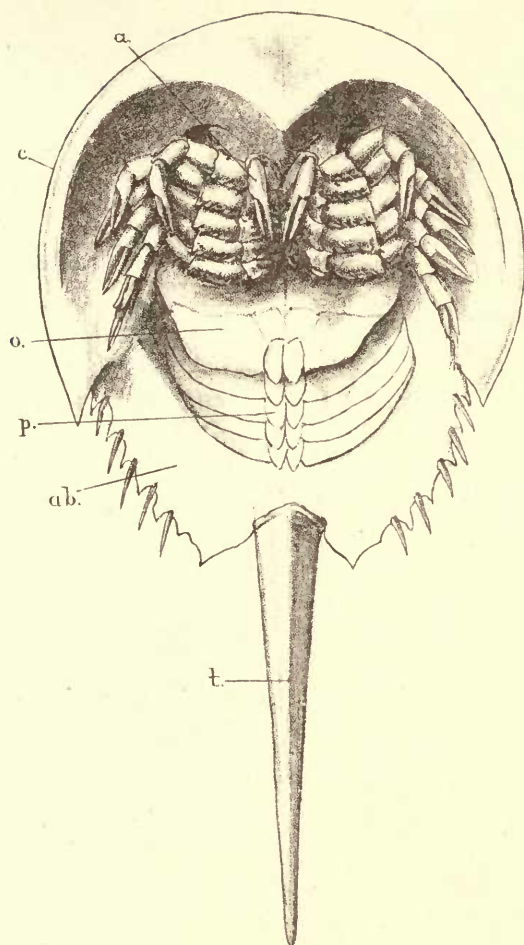


Fig. 2.

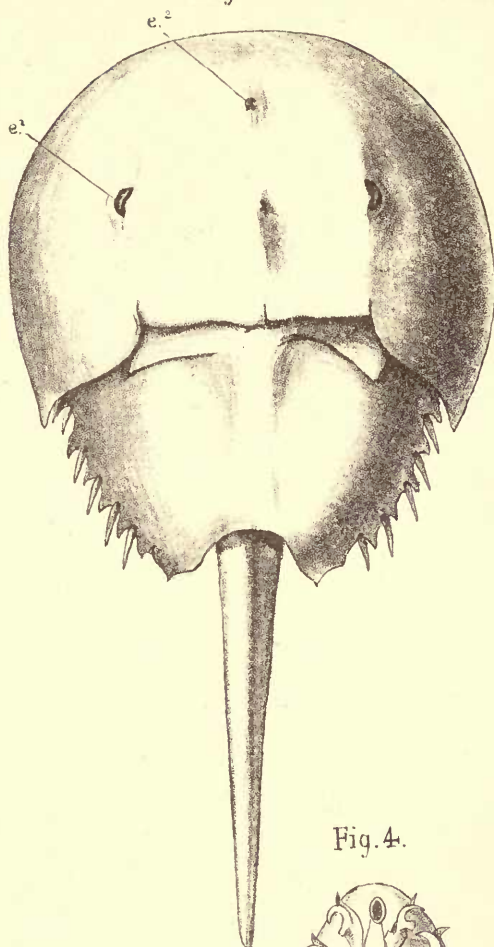


Fig. 3.

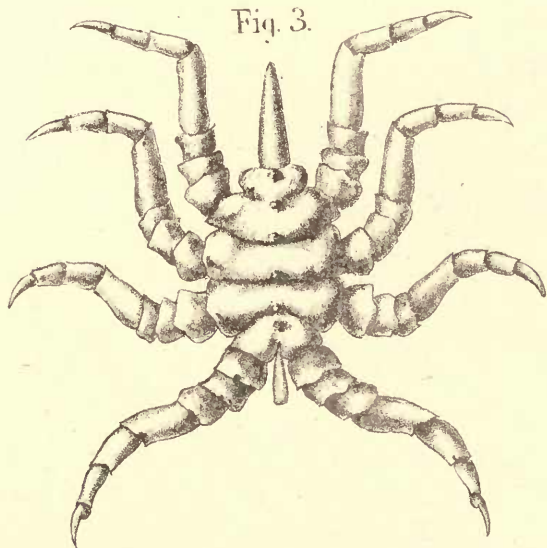


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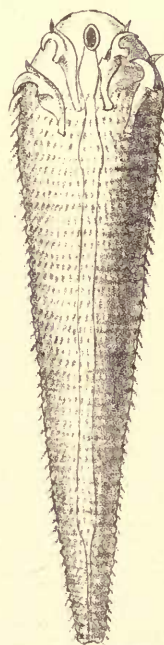


PLATE XXVII.

Class—HEMICHORDATA.

Balanoglossus.

FIG. 1.—BALANOGLOSSUS MINUTUS: DORSAL VIEW. $\times 1$.

p. proboscis: *c.* collar: *b.* branchial region: *g.* gastric region: *t.* tail region: *d.* dorsal vessel: *a.* anus.

FIG. 2.—BALANOGLOSSUS SARNIENSIS; ANTERIOR END: DORSAL VIEW. $\times 1$.

FIG. 3.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE BRANCHIAL PORTION OF BALANGLOSSUS MINUTUS. $\times 8$.

b. branchial arch: *p., p.* constricted pharynx: *d.* dorsal opening in the pharynx: *l. l.* lateral lobe, in which the generative glands lie: *lv.* lateral blood-vessel: *lg.* longitudinal ventral blood-vessel.

FIG. 4.—TORNARIA LARVA: DORSAL VIEW.—(After Metschnikoff.)

w. water vessel: *h.* heart: *p.* peritoneal sac.

FIG. 5.—STAGE IN THE GROWTH OF TORNARIA INTO BALANGLOSSUS: SIDE VIEW.
—(After Metschnikoff.)

m. mouth: *h.* heart: *v.* circular vessel: *b.* external branchial opening.

FIG. 6.—MORE ADVANCED STAGE.—(After Agassiz.)

w. water vessel: *h.* heart: *m.* mouth: *b.* external branchial slits.

FIG. 7.—STILL MORE ADVANCED STAGE.—(After Pagenstecher.) $\times 12$.

Fig. 1.

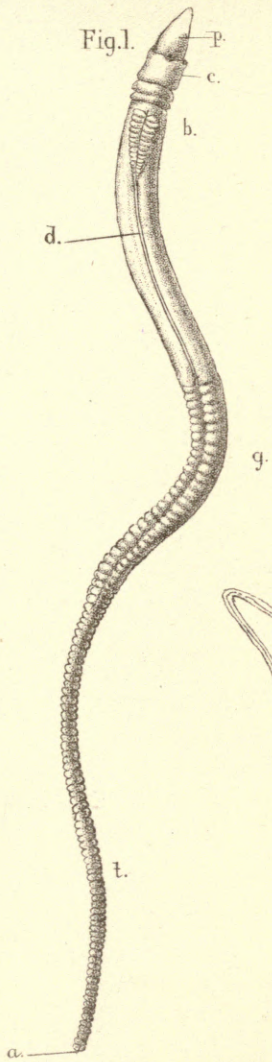


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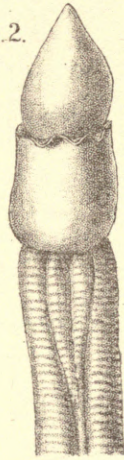


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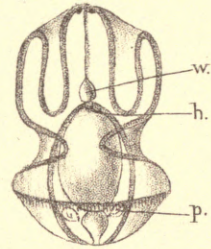


Fig. 5.

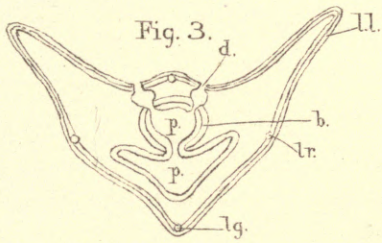
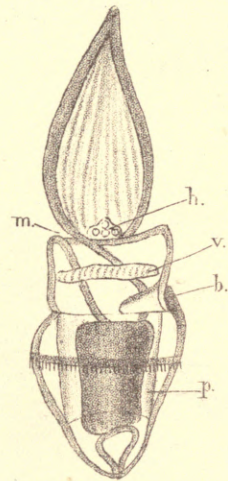


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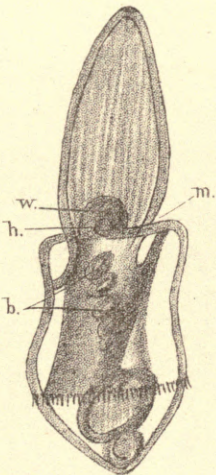
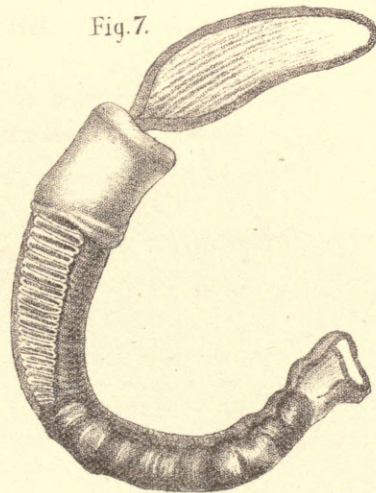


Fig. 7.



Class—TUNICATA.

THE SEA-SQUIRT OR ASCIDIAN (*Phallusia*).

FIG. 1.—ASCIDIAN. $\times 1$.

i. incurrent or pharyngeal opening: *e.* excurrent or atrial opening.

FIG. 2.—ASCIDIAN WITH LEFT HALF OF THE TUNIC REMOVED. $\times 1$.

t. right half of the tunic, attached to *m.* mantle, at *i.* pharyngeal and *a.* atrial openings.

Note.—In this species the intestine and other organs lie on the left side of the animal, while the branchial sac extends over the right side, as seen in Figs. 3 and 4. In these descriptions the pharyngeal opening is accounted ventral and the atrial opening dorsal.

FIG. 3.—ASCIDIAN WITH RIGHT HALF OF THE TUNIC REMOVED. $\times 1$.

b. branchial sac.

FIG. 4.—ASCIDIAN WITH HALF OF THE BRANCHIAL SAC REMOVED. $\times 1$.

t. tentacles in the pharyngeal opening: *e.* endostyle: *m.* mouth:
d. dorsal lamina.

FIG. 5.—ASCIDIAN FROM THE RIGHT SIDE: TUNIC REMOVED. $\times 2$.

s. stomach: *g.* genital gland: *i.* intestine: *d.* genital duct: *r.* rectum:
n. nerve ganglion.

FIG. 6.—TRANSVERSE SECTION THROUGH THE MIDDLE OF THE BODY. $\times 3$.

t. tunic: *m.* mantle: *b.* branchial sac: *l.* dorsal lamina: *e.* endostyle:
i. intestine: *g.* genital gland: *r.* rectum: *d.* genital ducts.

FIG. 7.—LARVAL ASCIDIAN. (*Fragarium elegans*.) $\times 50$.

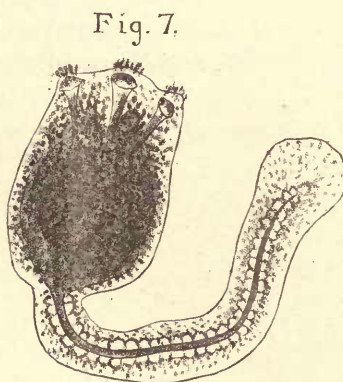
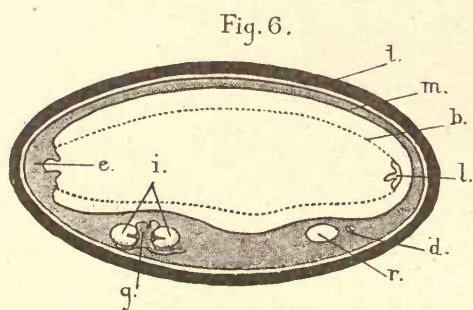
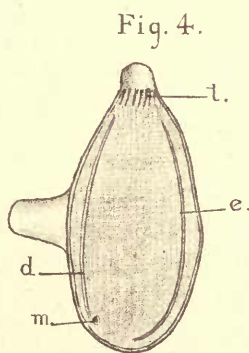
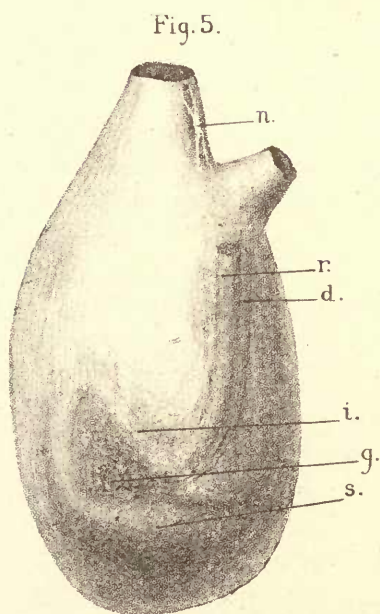
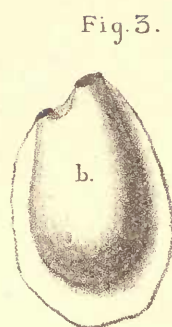
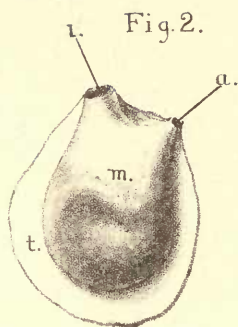
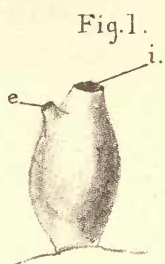


PLATE XXIX.

Class—CEPHALOCHORDA.

THE LANCELET (*Amphioxus lanceolatus*).

FIG. 1.—AMPHIOXUS: VIEWED AS A TRANSPARENT OBJECT. $\times 2\frac{1}{2}$.

m. mouth with cirri: *p.* pharynx: *r.* reproductive glands: *l.* liver:
a. p. atrial pore: *i.* intestine: *a.* anus: *nt.* notochord: *n.*
spinal cord: *s.* septa between the myotomes.

FIG. 2.—HEAD. $\times \frac{5.0}{4}$.

nt. notochord: *e.* eye: *n.* spinal cord: *s.* septa between the myotomes:
r. cartilaginous rod bearing cirri: *l.* lobes of the pharynx:
a. branchial arches.

FIG. 3.—TRANSVERSE SECTION THROUGH THE REGION OF THE LIVER. $\times 10$.

f. skeleton of the dorsal fin: *n.* spinal cord: *nt.* notochord
surrounded by its sheath: *a.*¹ dorsal aorta: *g.*¹ hyperbranchial
groove: *l.* liver: *o.* ovary: *g.*² hypobranchial groove: *a.*²
ventral aorta: *p.* cavity of the pharynx: *b.* branchial arches.

FIG. 4.—TRANSVERSE SECTION PASSING THROUGH THE ANUS. $\times 10$.

f. dorsal fin: *n.* spinal cord: *nt.* notochord: *a.* dorsal aorta:
i. intestine: *an.* anus: *v.* ventral fin.

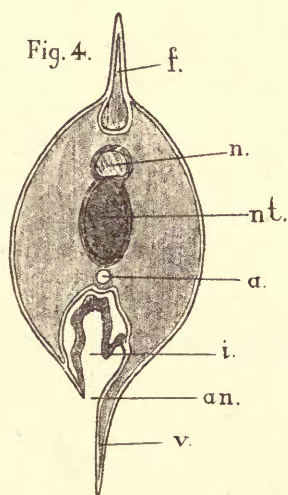
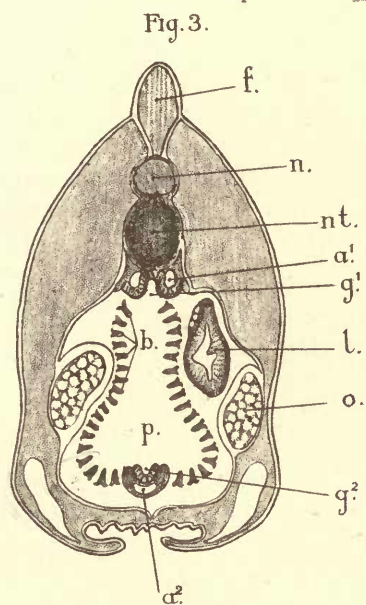
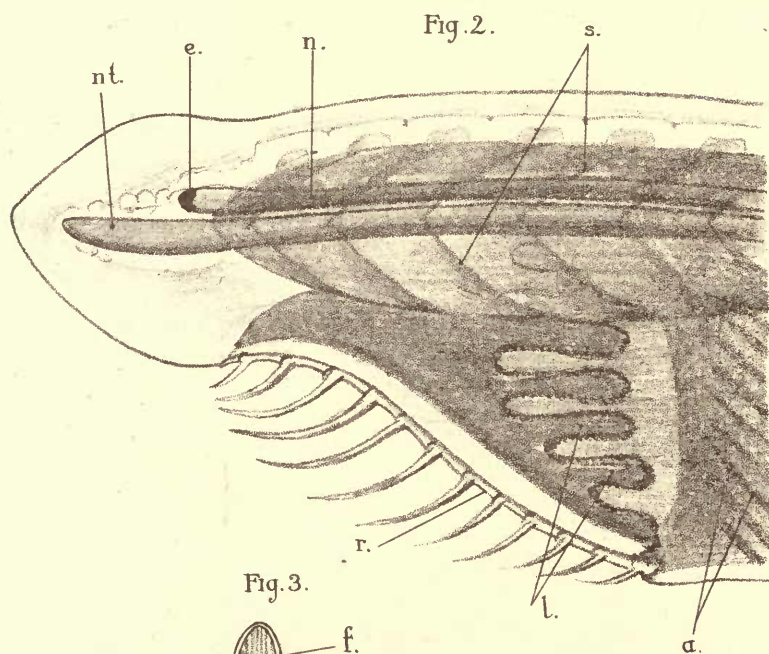
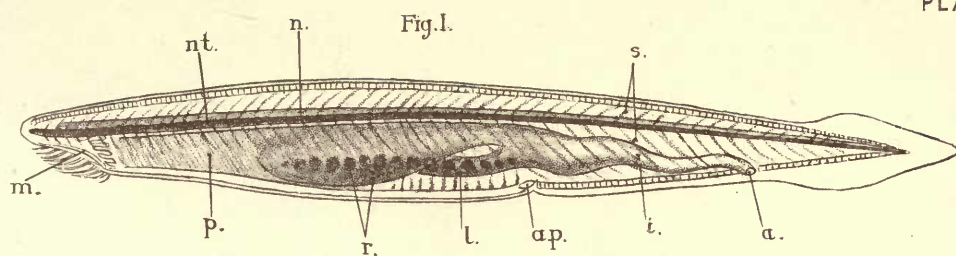


PLATE XXX.

Class—CYCLOSTOMATA.

THE HAG-FISH (*Myxine glutinosa*).

FIG. 1.—DISSECTION FROM THE VENTRAL ASPECT. $\times \frac{2}{3}$.

n. nostril surrounded by tentacles: *m.* mouth: *o.* œsophagus:
p. branchial pouches: *h.* heart: *l.* liver: *i.* intestine: *a.* anus:
ov. ovary: *e.* eggs: *m. g.* mucous glands.

FIG. 2.—BRANCHIAL SYSTEM. $\times \frac{3}{4}$.

o. œsophagus: *i.* internal branchial ducts: *b.* branchial pouches:
d. external branchial ducts: *s.* special duct on the left side:
c. common branchial duct: *p.* branchial pore: *v.* ventricle:
a. branchial artery giving off a branch to each gill.

THE RIVER LAMPREY (*Petromyzon fluviatilis*).

FIG. 3.—MOUTH. $\times 1$.

FIG. 4.—SIDE VIEW. $\times 1$.

e. eye: *b.* external branchial openings.

Fig. 1.

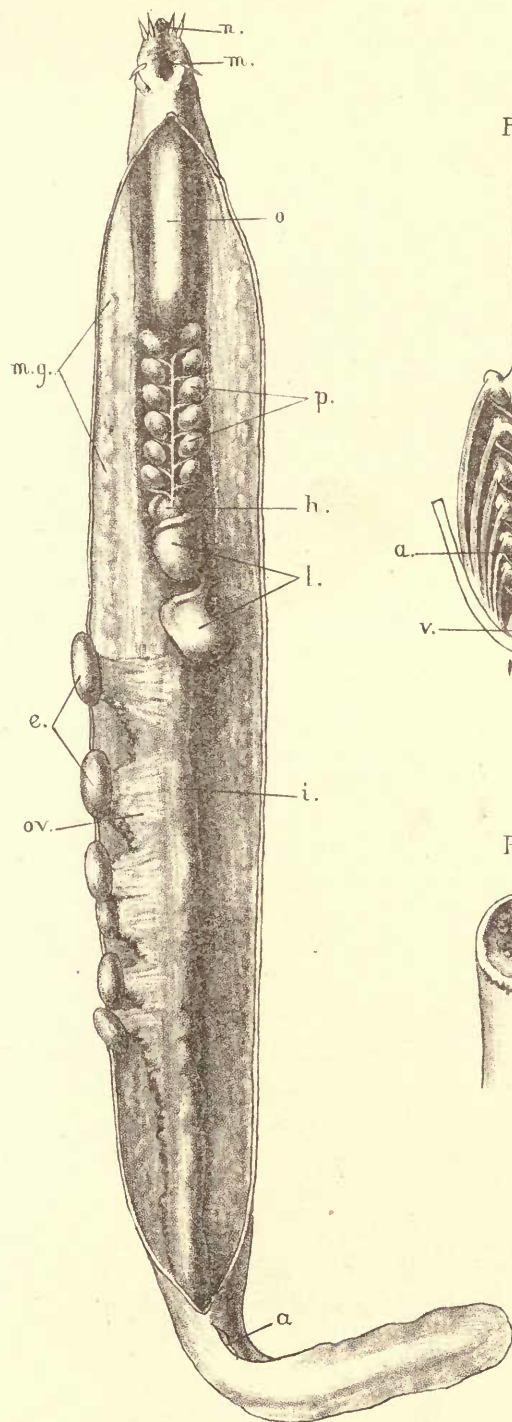


Fig. 2.

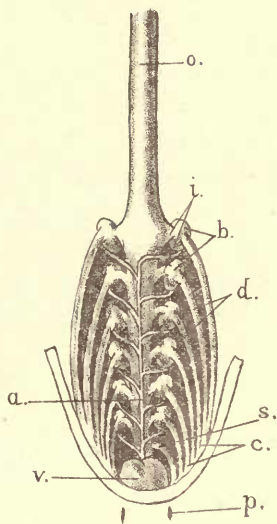


Fig. 3.



Fig. 4.

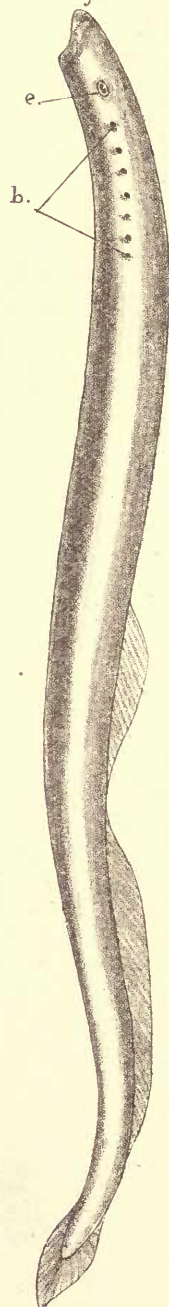


PLATE XXXI.

Class—PISCES.

ELASMOBRANCHII.

THE SKATE (*Raia*).

FIG. 1.—MALE SKATE: VENTRAL ASPECT. $\times \frac{1}{9}$.

r. rostrum: *n.* right nostril: *nb.* naso-buccal groove: *f.* fronto-nasal process: *m.* mouth with the jaws and teeth: I.—V. the five branchial apertures: VI. rudimentary branchial aperture: *p.* pectoral fin: *pv.* pelvic fin: *cp.* clasper: *c.* cloaca: *a.* abdominal pores: *t.* tail.

FIG. 2.—DERMAL DENTICLE: SHOWING THE ROUNDED BASAL PIECE AND THE SHORT SPINE. $\times 1$.

FIG. 3.—TAIL: DORSAL VIEW. $\times \frac{1}{9}$.

FIG. 4.—HEAD: DORSAL VIEW. $\times \frac{1}{9}$.

e. eye: *s.* spiracle.

FIG. 5.—ABDOMINAL VISCERA. $\times \frac{1}{4}$.

c. coracoid portion of the pectoral girdle: *l.¹*, *l.²*, *l.³* right, middle and left lobes of the liver: *g.* gall-bladder: *d.* duodenum: *l.* large intestine: *r.* rectum: *gl.* rectal gland: *s.* stomach: *sp.* spleen: *p.* pelvic girdle: *c.* cloaca: *a.* abdominal pore.

FIG. 6.—ALIMENTARY TRACT. $\times \frac{1}{4}$.

a. cesophagus: *s.* stomach cut open to show *r.* rugæ: *l.* large intestine with *sl.* spiral valve: *r.* rectum: *gl.* rectal gland: *c.* cloaca: *a.* abdominal pore.

Fig. 1.

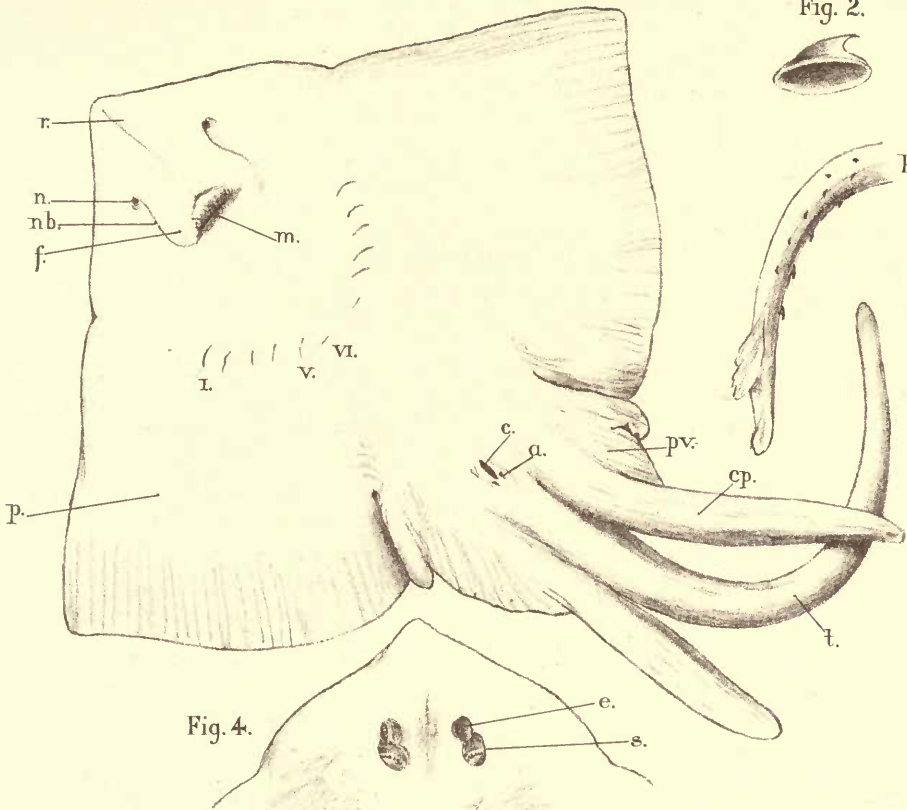


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

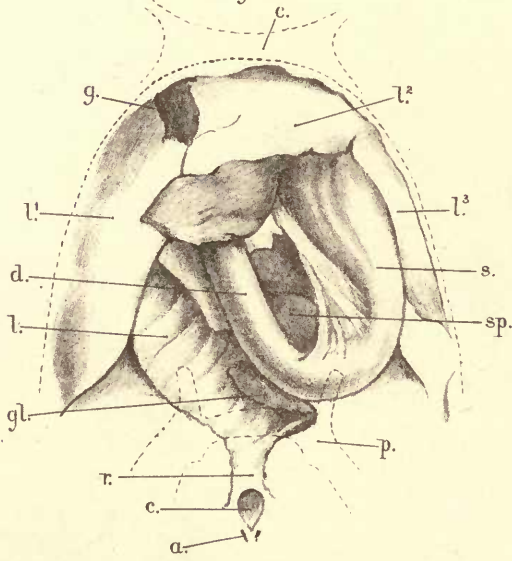


Fig. 6.

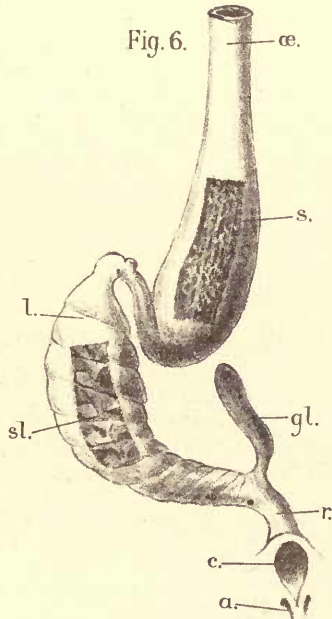


PLATE XXXII.

Class—PISCES—*continued*.

THE SKATE—*continued*.

FIG. 1.—VENOUS CIRCULATION: HEART AND AFFERENT BRANCHIAL VESSELS:
VENTRAL ASPECT. $\times \frac{1}{2}$.

c. s. cardinal sinus: *h.* hepatic sinus: *s. c.* sinus of Cuvier: *s. v.* sinus venosus: *a. c.* anterior cardinal vein: *i. j.* inferior jugular vein: *f.* femoral vein: *e.* epigastric vein: *ab.* veins from the abdominal wall: *b.* brachial vein: *i. h.* ilio-hæmorrhoidal vein: *c. v.* caudal vein: *r. p.* renal-portal vein: *p.* branches of the renal-portal vein from the pelvic and lumbar regions: *k.* kidney: *r.* renal veins: *c. v.¹*, *c. v.²* posterior cardinal vein: *s. s.* spermatic sinus: *h. v.* hepatic veins.
a. auricle: *v.* ventricle: *c.* conus arteriosus: *ao.* ventral aorta: *i.¹*, *i.²* posterior and anterior innominate arteries giving off *a.¹*—*a.⁵* the afferent branchial vessels: *t.* thyroid gland.

FIG. 2.—SINUS OF CUVIER AND SINUS VENOSUS LAID OPEN. \times about $\frac{1}{2}$.

h. heart: *s. v.* sinus venosus: *s. c.* sinus of Cuvier: *h.* hepatic sinus: *a. c.* anterior cardinal vein: *i. j.* inferior jugular vein: *b.* brachial vein: *c. v.* posterior cardinal vein: *c. s.* cardinal sinus: *v.* vertebral column.

FIG. 3.—THE HEART: VENTRAL VIEW WITH PART OF THE AURICLE, VENTRICLE AND CONUS ARTERIOSUS REMOVED. $\times 1$.

a. parts of the auricle: *v.* ventricle (The arrow passes through the auriculo-ventricular opening): *va.* valves: *ao.* ventral aorta.

FIG. 4.—RELATION OF THE RIGHT SINUS OF CUVIER TO THE SHOULDER GIRDLE.
 $\times 1$.

s. c. sinus of Cuvier: *br.* brachial vein: *s. c. f.* scapulo-coracoid foramen: *c. f.* coracoid foramen.

FIG. 5.—JUNCTION OF THE LEFT SINUS OF CUVIER AND THE HEPATIC SINUS. $\times 1$.

Fig. 2.

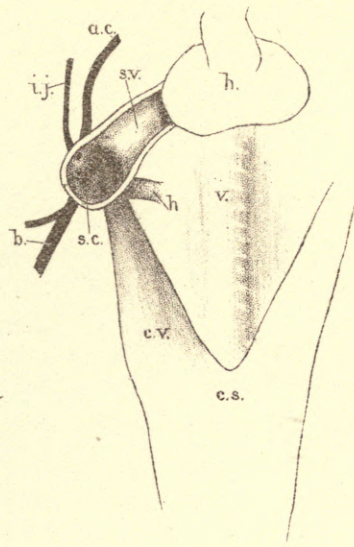


Fig. 3.

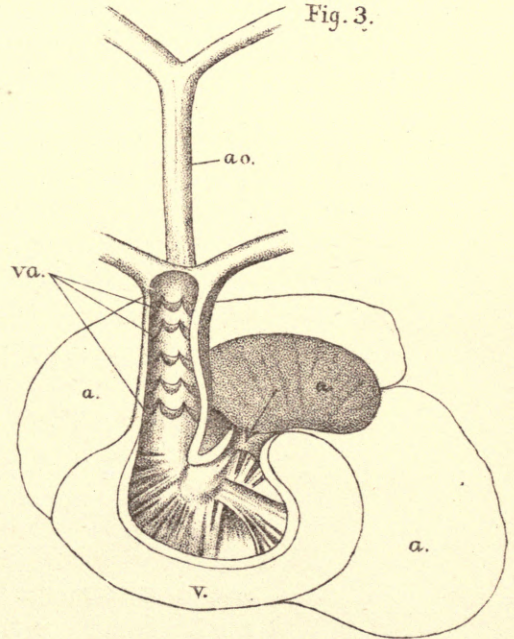


Fig. 4.

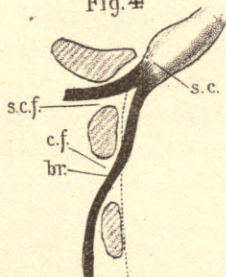
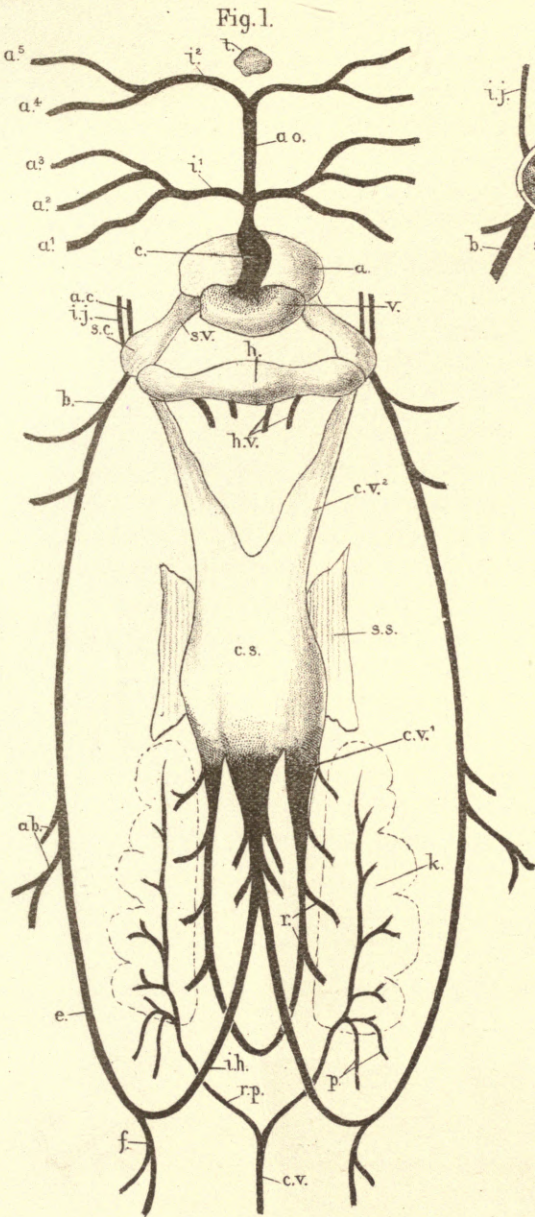


Fig. 5.



Class—PISCES—*continued*.

THE SKATE—*continued*.

FIG. 1.—SYSTEMS OF THE EFFERENT BRANCHIAL VESSELS AND THE DORSAL AORTA: VENTRAL VIEW. $\times \frac{1}{3}$.

*e.*¹-*e.*⁹ efferent branchial arteries: *h.* hyoidean artery: *c.* common carotid artery: *e.* external carotid artery; *i.* internal carotid artery: *f.* foramen in the base of the skull: *s.* subclavian artery: *h.b.* hypobranchial artery; *cæ.* celiac artery: *d.* duodenal artery: *h.* hepatic artery: *g.* gastric artery: *s.m.* superior mesenteric artery: *i.* intestinal artery: *p.* pancreatic arteries: *sp.* splenic artery: *d.a.* dorsal aorta: *g.a.* arteries to the oviducts in the female: *i.m.* inferior mesenteric artery: *sp.* spermatic artery in the male: *r.* renal arteries: *il.* iliac artery: *c.* caudal artery.

FIG. 2.—RELATION OF THE RIGHT HYPOBRANCHIAL ARTERY TO THE SHOULDER GIRDLE. $\times 1$.

s. subclavian artery: *h.* hypobranchial artery.

FIG. 3.—HEART, AFFERENT BRANCHIAL VESSELS AND HYPOBRANCHIAL ARTERY: VENTRAL VIEW. $\times 1$.

a. auricle: *v.* ventricle: *s.* subclavian artery: *h.b.* hypobranchial artery.

FIG. 4.—HEART, AFFERENT AND EFFERENT BRANCHIAL VESSELS: VIEW FROM THE LEFT SIDE. $\times \frac{1}{2}$.

a.c. anterior cardinal vein: *c.* posterior cardinal vein: *b.* brachial vein: *h.s.* hepatic sinus: *i.* inferior jugular vein: *s.c.* sinus of Cuvier: *s.v.* sinus venosus: *a.* auricle: *v.* ventricle: *c.a.* conus arteriosus: *v.a.* ventral aorta, giving off posterior and anterior innominate arteries: *a.*¹-*a.*⁵ afferent branchial vessels: *e.*¹-*e.*⁹ efferent branchial vessels: *hy.* hyoidean artery: *c.c.* common carotid: *d.* dorsal aorta: *s.a.* subclavian artery: *h.* hypobranchial artery.

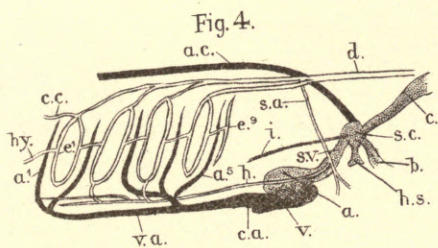
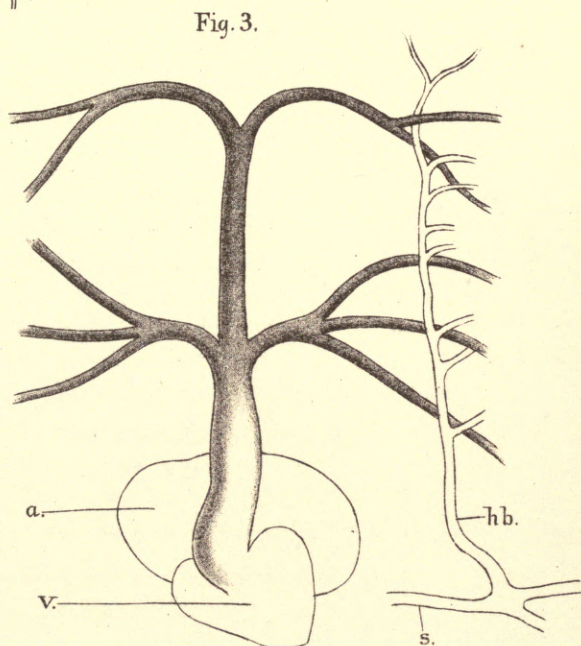
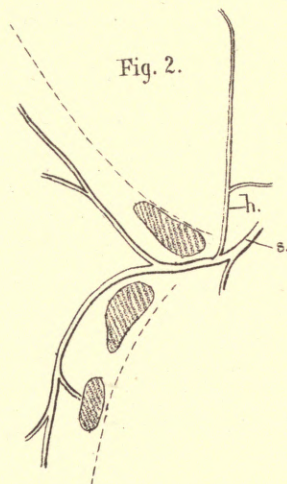
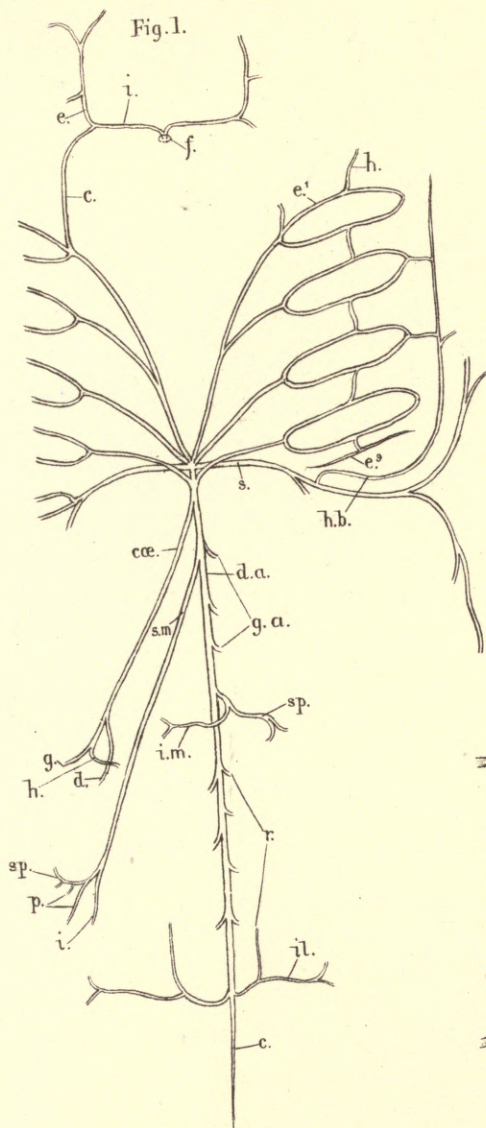


PLATE XXXIV.

Class—PISCES—continued.

THE SKATE—continued.

FIG. 1.—SKELETON: VENTRAL VIEW. From a young specimen of *Raja batis*.
 $\times \frac{2}{3}$.

r. c. rostral cartilage: *r.* rostrum: *n.* nasal capsule: *l.¹-l.⁴* labial cartilages: *an.* antorbital cartilage: *p. p.* palato-ptyergoid (or palato-quadrate, or upper jaw): *m.* mandibular (or Meckelian, or lower jaw): *s.* spiracular cartilage: *h.* hyoid arch: *hm.* hyomandibular: *a.* auditory capsule: *hb.¹* first hypobranchial: *b.¹-b.⁵* first to fifth branchial arches: *b.* basibranchial plate with anterior cornua: *v.* vertebral plate: *p.* proptyergium: *ms.* mesopptyergium: *mt.* metapptyergium: *p.* pubic portion of the pelvic girdle: *pr.* prepubic process: *i.* iliac process: *a.¹, a.²* acetabular facets.

FIG. 2.—VERTEBRAL COLUMN: LONGITUDINAL SECTION. $\times \frac{4}{3}$.

c. centrum: *n.* neural process: *i.* inter-neural plate: *s.* neural spine: *f.¹, f.²* foramina for the anterior and posterior roots of the spinal nerves.

FIG. 3.—VERTEBRA: BODY REGION. $\times \frac{4}{3}$.

c. centrum: *t.* transverse process: *r.* rib: *n.* neural process: *i.* inter-neural plate: *s.* neural spine.

FIG. 4.—VERTEBRA: TAIL REGION. $\times \frac{4}{3}$.

c. centrum: *n.* neural process: *s.* neural spine: *h.* hæmal process: *h. s.* hæmal spine.

FIG. 5.—LEFT ICTHYOPTERYGIUM: VENTRAL VIEW. $\times \frac{2}{3}$.

c. coracoid portion of the pectoral girdle: *p.* proptyergium: *ms.* mesopptyergium: *mt.* metapptyergium.

Fig. 1.

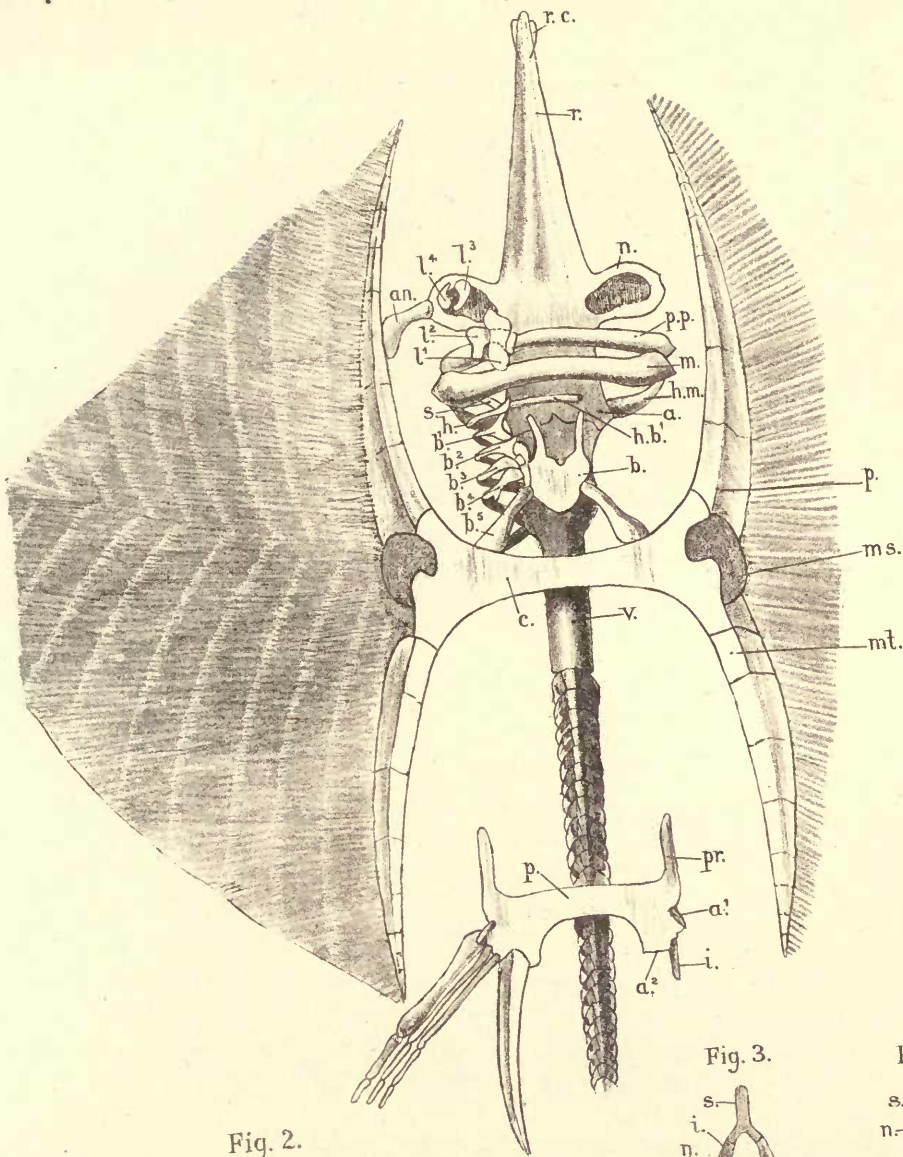


Fig. 2.



Fig. 3.

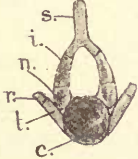
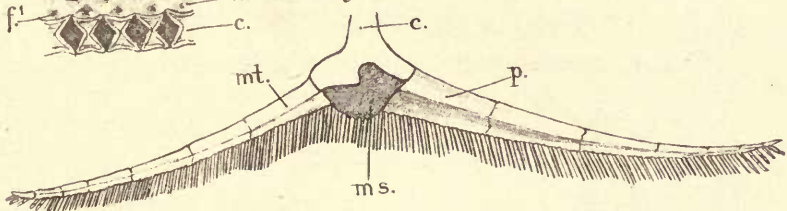


Fig. 4.



Fig. 5.



Class—PISCES—*continued*

THE SKATE—*continued*.

FIG. 1.—SKULL: VENTRAL VIEW. $\times \frac{1}{2}$.

r. rostrum : *n.* nasal capsule : *or.* foramen for the orbito-nasal branch of the fifth nerve : II. foramen for the optic nerve : *a.* auditory capsule : *o.* right occipital condyle : *f.* foramen magnum.

FIG. 2.—SKULL: DORSAL VIEW. $\times \frac{1}{2}$.

r. rostrum : *n.* nasal capsule : *a.f.* anterior fontanelle : *p.* posterior fontanelle : *a.* auditory capsule : *o.* right occipital condyle.

FIG. 3.—SKULL: SIDE VIEW. $\times \frac{1}{2}$.

r. rostrum : *n.* nasal capsule : *p.* foramen for the palato-nasal branch of the fifth nerve : *or.* foramen for the orbito-nasal branch of the fifth nerve : II. foramen for the optic nerve : III. foramen for third nerve : V., VII. foramina for the fifth and seventh nerves : *a.* auditory capsule.

FIG. 4.—PECTORAL GIRDLE: DORSAL VIEW. $\times \frac{1}{2}$.

c. coracoid portion : *s.* scapular, and *s.s.* supra-scapular portions : *f.¹, f.², f.³* anterior, middle and posterior glenoid facets.

FIG. 5.—PECTORAL GIRDLE: SIDE AND VENTRAL VIEW. \times about $\frac{1}{2}$.

c. coracoid portion : *s.* scapular, and *s.s.* supra-scapular portions : *c.f.* coracoid fontanelle : *s.f.* scapular fontanelle : *s.c.f.* scapulo-coracoid fontanelle : *f.¹, f.², f.³* anterior, middle and posterior glenoid facets.

FIG. 6.—VERTEBRAL PLATE AND PECTORAL GIRDLE: DORSAL VIEW. $\times \frac{1}{2}$.

s. scapular, and *s.s.* supra-scapular portions : *v.* vertebral plate : *d.* dorsal ridge : *c.* articulation with the skull : *b.* fifth branchial arch.

FIG. 7.—VERTEBRAL PLATE: DORSAL VIEW. $\times \frac{1}{2}$.

s.s. supra-scapular portion of the pectoral girdle ; *d.* dorsal ridge of the plate : *l.* lateral ridge.

FIG. 8.—VERTEBRAL PLATE: SIDE VIEW. $\times \frac{1}{2}$.

s.s. supra-scapular portion : *d.* dorsal ridge of the plate : *l.* lateral ridge.

Fig. 1.

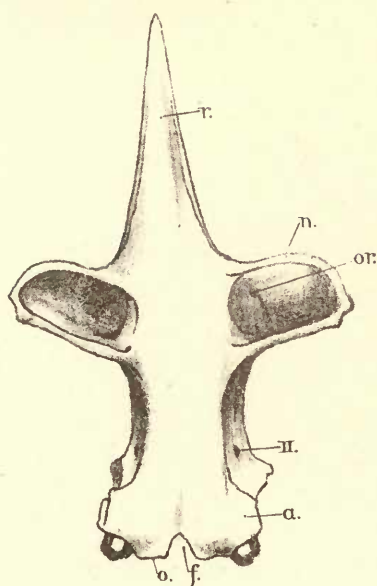


Fig. 2.

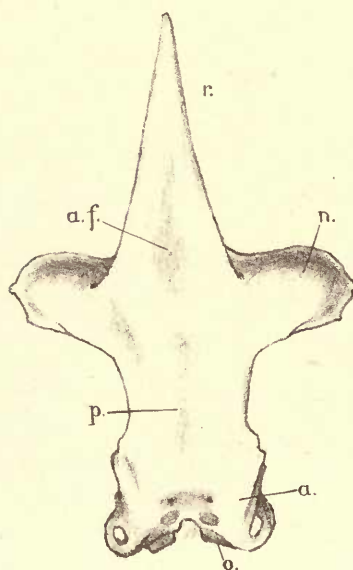


Fig. 3.

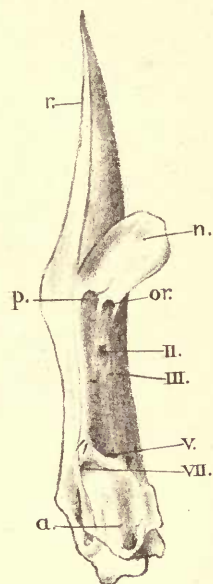


Fig. 4.

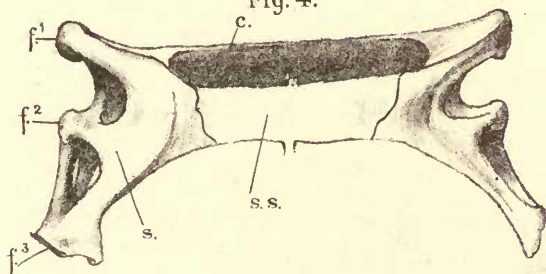


Fig. 5.

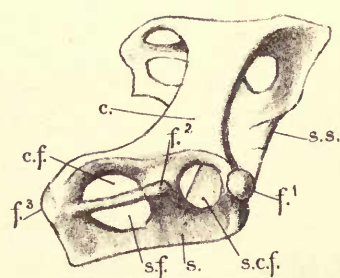


Fig. 6.

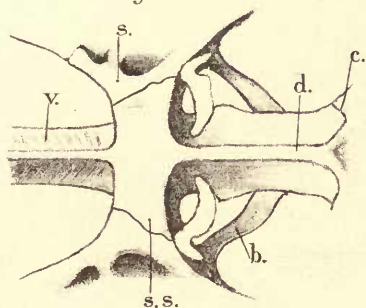


Fig. 7.

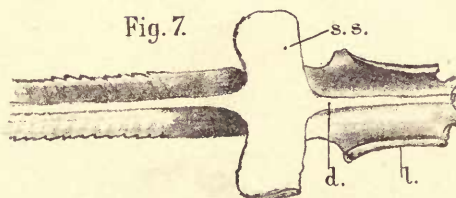


Fig. 8.

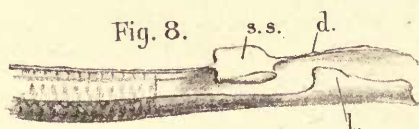


PLATE XXXVI.

Class—PISCES—*continued.*

THE SKATE—*continued.*

FIG. 1.—BRAIN AND CRANIAL NERVES: DORSAL ASPECT. $\times \frac{3}{5}$.

o. olfactory bulb: *cr.* cerebral hemispheres: *t.* optic thalamus:
o.l. optic lobe: *cm.* cerebellum: *v.*⁴ fourth ventricle: *m.*
medulla oblongata: *s.* spinal cord: *b.* brachial plexus: *v.*
vertebral plate: *r.* lateral ridge of the vertebral plate: *n.* nasal
capsule: *e.* eye: *a.c.* antorbital cartilage: I.-X. the various
cranial nerves.

FIG. 2.—RIGHT EAR: DISSECTION FROM ABOVE. $\times 1$.

a., p., h. anterior, posterior and horizontal semicircular canals with
their ampullæ.

FIG. 3.—RIGHT EAR: SIDE VIEW. $\times 1$.

a. v. aqueductus vestibuli: *a., p., h.* anterior, posterior and horizontal
semicircular canals: *a.*¹, *a.*², *a.*³ ampullæ: *v.* vestibule.

Fig. 1.

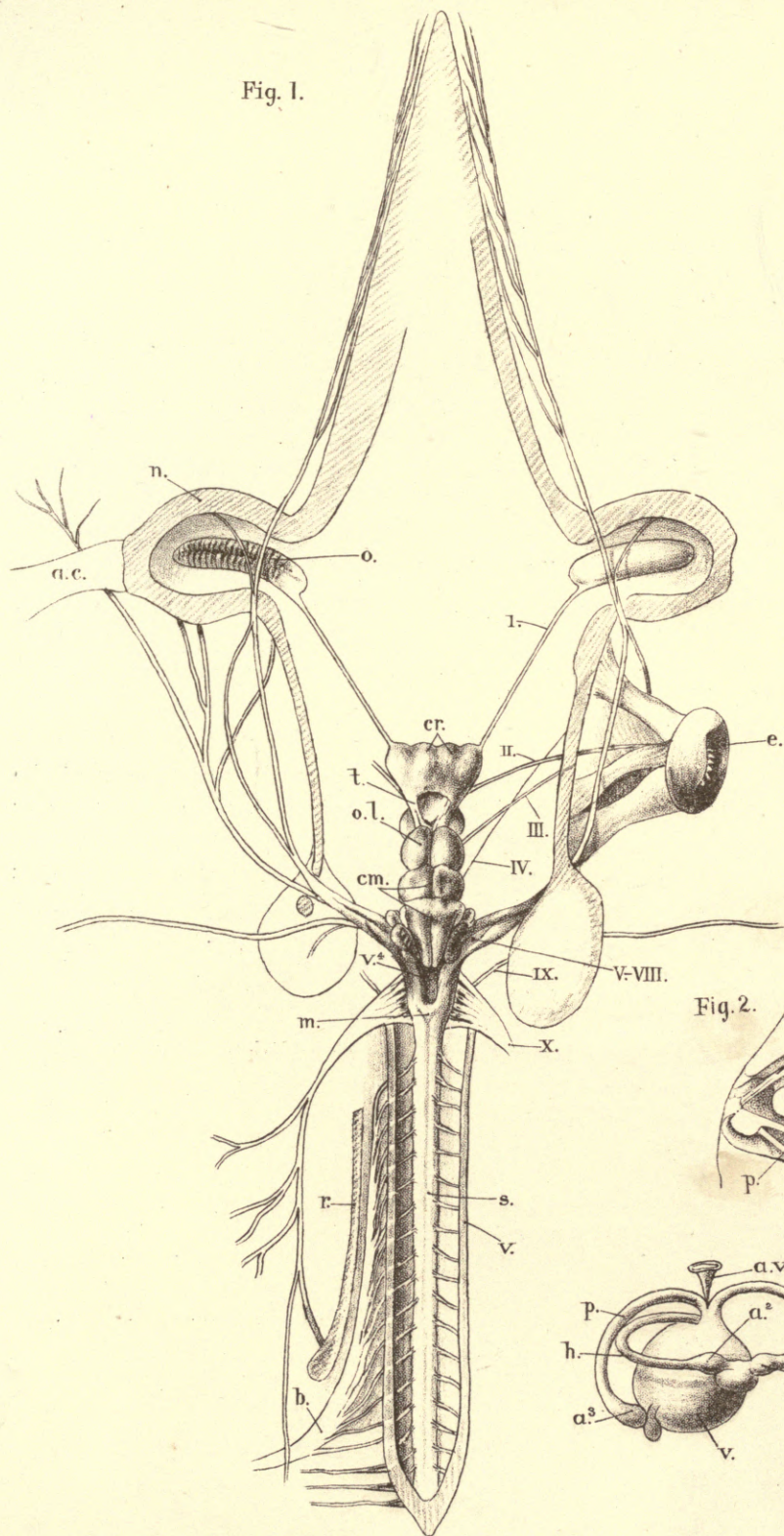


Fig. 2.

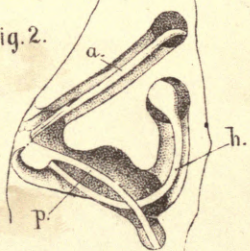


Fig. 3.

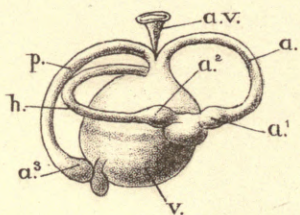


PLATE XXXVII.

Class—PISCES—*continued*.

THE SKATE—*continued*.

FIG. 1.—URINO-GENITAL SYSTEM: MALE. $\times \frac{1}{2}$.

*t.*¹, *t.*² testes (The left one has been partly laid over): *e.* epididymis:
v. vas deferens: *s.* seminal vesicle: *s. s.* sperm sac: *k.* kidney:
p. urino-genital papilla: *c.* cloaca: *a.* abdominal pore.

FIG. 2.—URINO-GENITAL SYSTEM OF AN IMMATURE FEMALE. $\times \frac{1}{2}$.

o. right ovary (The left has been removed): *of.* opening of the
conjoined oviducts (Fallopian tubes) into the body cavity:
æ. œsophagus: *f.* Fallopian tube (anterior portion of the
oviduct): *g.* oviducal gland: *ut.* uterus: *m.* mesonephric duct:
k. kidney: *u.* urinary bladder: *p.* urinary papilla: *c.* cloaca:
a. abdominal pore.

FIG. 3.—OVIDUCTS OF A MATURE FEMALE. $\times \frac{1}{2}$.

f. Fallopian tube: *g.* oviducal gland: *ut.* uterus.

FIG. 4.—"PURSE" CONTAINING AN EGG. $\times \frac{1}{2}$.

Note.—The urino-genital organs, both male and female, vary considerably in the
different species of *Raia*.

Fig. 1.

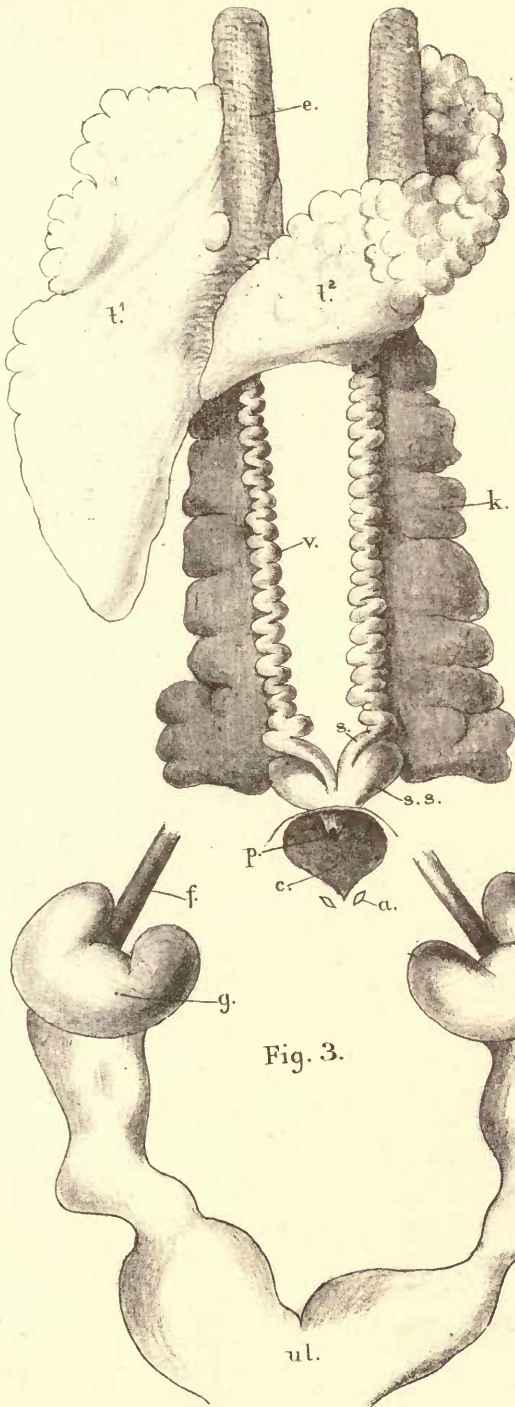


Fig. 3.

Fig. 2.

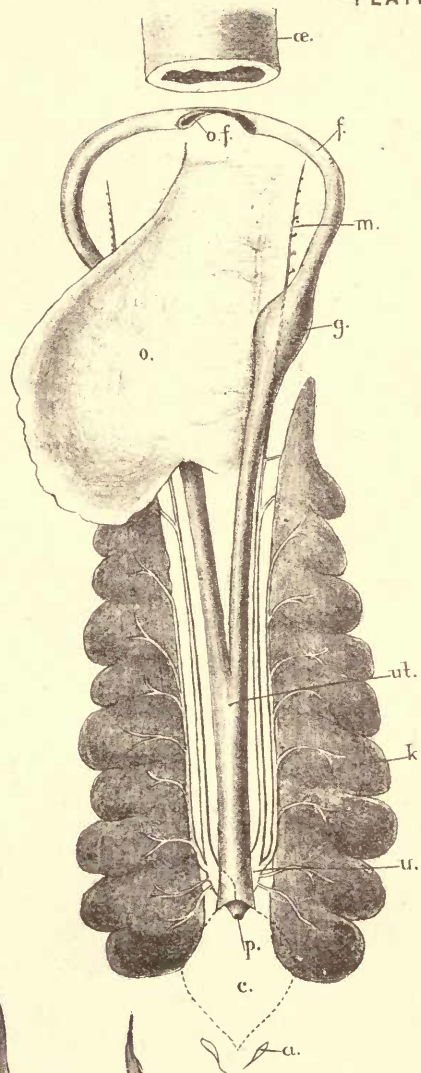


Fig. 4.



PLATE XXXVIII.

Class—PISCES—continued.

TELEOSTEI.

THE COD (*Gadus morrhua*).

FIG. 1.—EXTERNAL CHARACTERS. $\times \frac{1}{5}$.

n. nostrils: *e.* eye: *b.* barbule: *o.* operculum: *br.* branchiostegal membrane: *a.* anus: *p.* pectoral fin: *v.* pelvic fin: *d.¹, d.², d.³* dorsal fins: *a.¹, a.²* anal fins: *c.* caudal fin.

FIG. 2.—CUTANEOUS NERVES. $\times \frac{1}{5}$.

V., V., V. cutaneous branches of the fifth cranial nerve to the dorsal and anal and pectoral and pelvic fins: X., X. cutaneous branches of the tenth cranial nerve to the lateral line and the muscles.

FIG. 3.—INTERNAL ORGANS. $\times \frac{1}{2}$.

æ. cesophagus: *s.* stomach: *c.* pyloric cæca: *d.* duodenum: *i.* intestine: *r.* rectum: *a.* anus: *l.¹, l.², l.³* lobes of the liver: *g.* gall-bladder: *sp.* spleen: *g. a.* genital aperture: *ur.* ureter: *bl.* lobes of the bladder: *u.* urinary aperture.

FIG. 4.—INTERNAL ORGANS AFTER REMOVAL OF THE BODY WALL OF THE LEFT SIDE. \times about $\frac{1}{2}$.

p. f. pectoral fin: *v.* pelvic fin: *l.* liver: *sp.* spleen: *s.* swim-bladder: *p.* peritoneum: *st.* stomach: *h.* pyloric cæca: *i.* intestine.

Fig. 1.

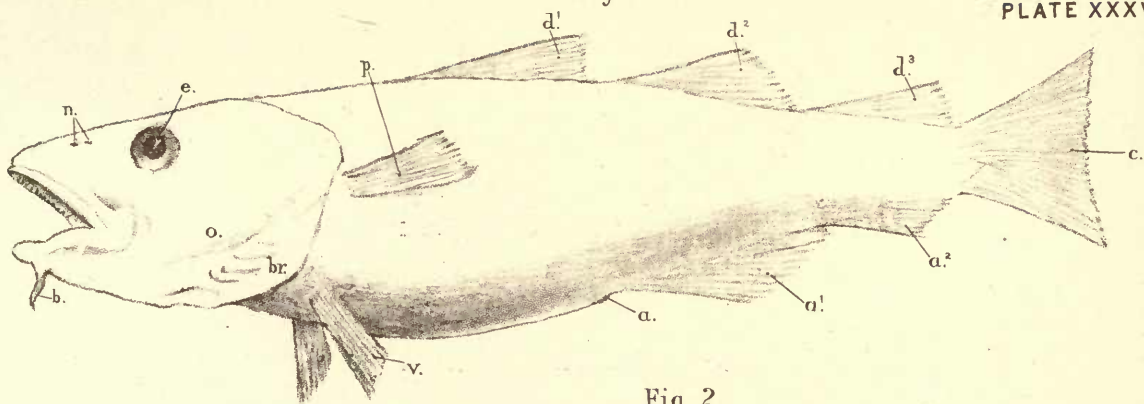


Fig. 2.

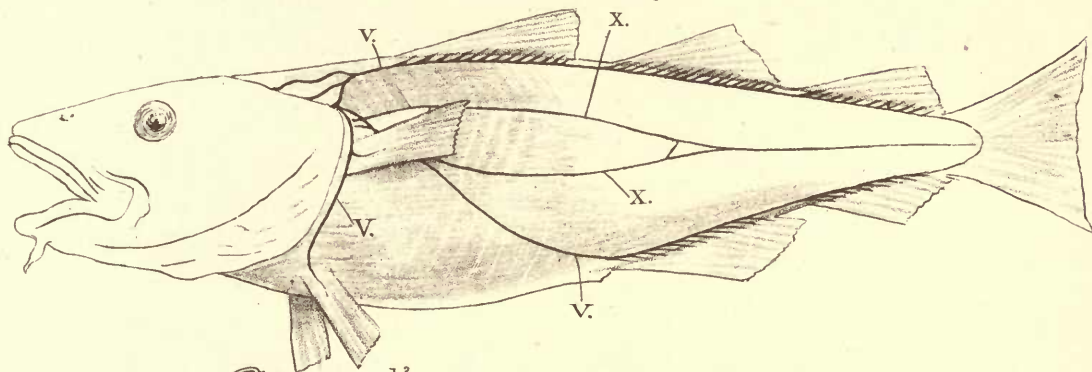


Fig. 3.

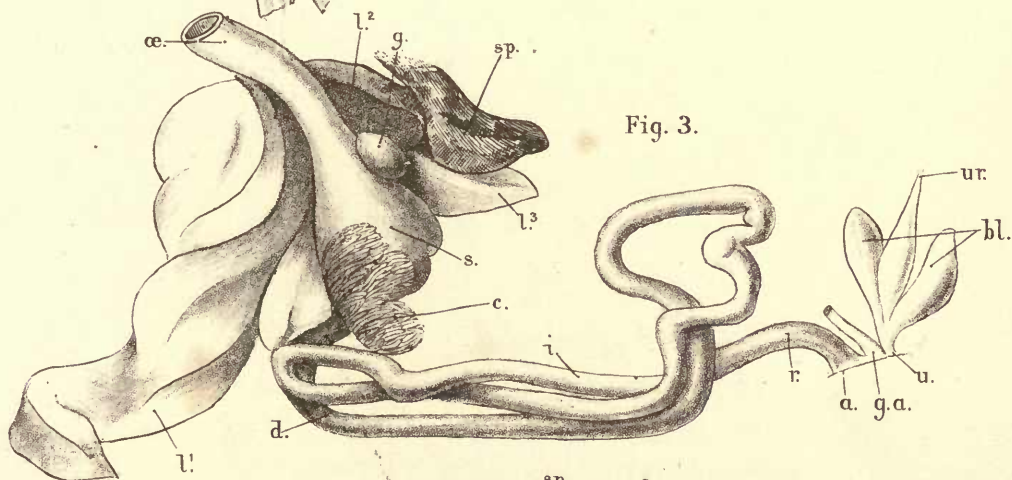


Fig. 4.

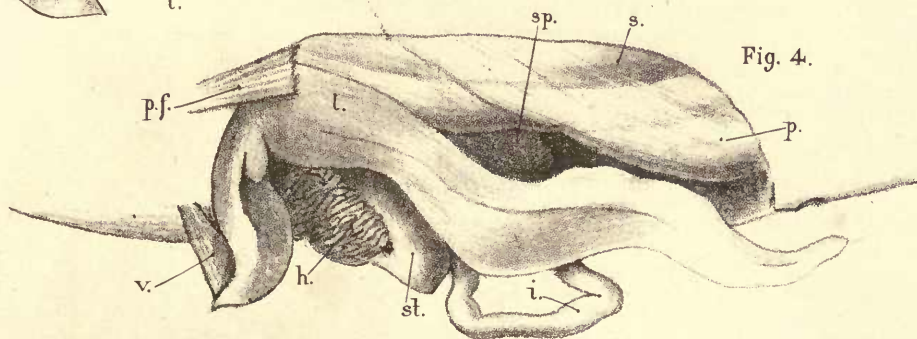


PLATE XXXIX.

Class—PISCES—*continued*.

THE COD—*continued*.

FIG. 1.—BRANCHIAL CIRCULATION. Some of the gill filaments have been removed in order to show the relation of the afferent vessels to the gill arches. \times about $\frac{1}{2}$.

v. a. ventral aorta giving off the afferent branchial vessels: *c.* cephalic circle receiving the efferent branchial vessels.

FIG. 2.—CIRCULATORY SYSTEM: VIEW FROM THE LEFT SIDE. $\times \frac{2}{5}$.

s. v. sinus venosus: *a.* auricle: *v.* ventricle: *v. a.* ventral aorta giving off the left afferent vessels: *hy.* hyoidean artery: *p. f.* artery to the pelvic fin: *ps.* pseudobranchia: *e.* eye: *c. c.* posterior portion of the cephalic circle: *sc.* left subclavian artery: *cæ.* coeliac artery: *m.* mesenteric artery (The third artery is the right subclavian): *a.* dorsal aorta: *c. a.* caudal artery: *c. v.* caudal vein: *p.¹, p.²* posterior cardinal veins: *s.* swim-bladder: *r.* rete mirabile: *a.¹, a.²* anterior cardinal veins: *c.* Cuvierian duct: *i.* inferior jugular vein: *v. s.* vessels to the bladder and the body walls: *sp. v., sp. a.* spermatic vein and artery: *p.* portal vein to the liver; *h.* hepatic veins.

FIG. 3.—DIAGRAM OF THE CIRCULATION IN A FISH. Altered from M. H. Milne-Edwards.

a. auricle: *v.* ventricle; *b.* bulbus arteriosus: *v. a.* ventral aorta: *b. v.* branchial vessels: *d. a.* dorsal aorta: *i.* intestine: *k.* kidney: *p.* portal vein: *c.¹, c.²* anterior and posterior cardinal veins: *s.* sinus venosus.

Fig. 3.

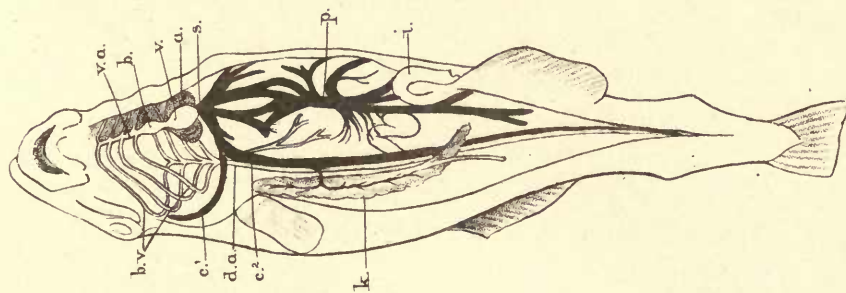


Fig. 2.

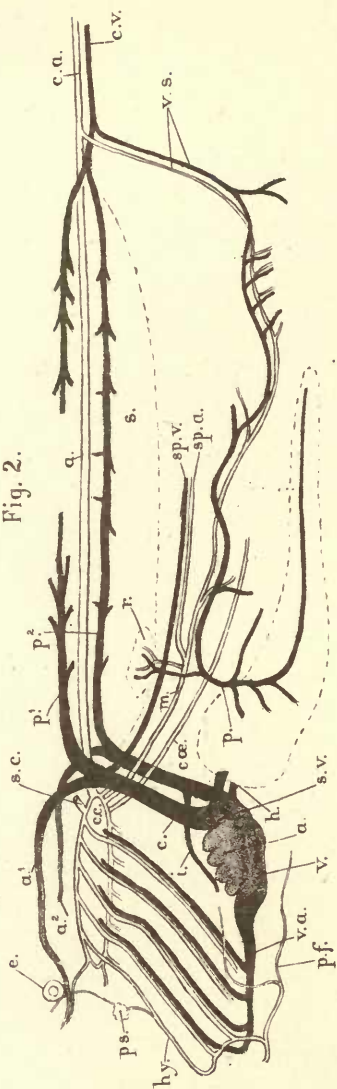


Fig. 1.

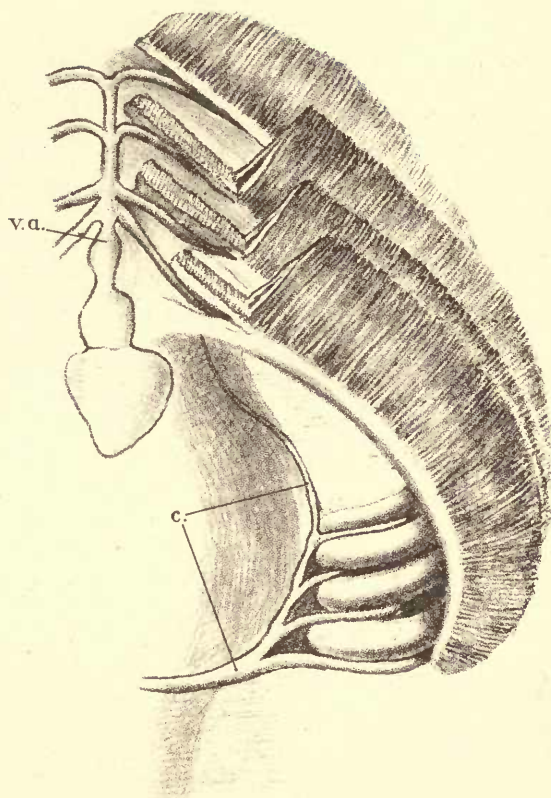


PLATE XL.

Class—PISCES—*continued.*

THE COD—*continued.*

FIG. 1.—SKELETON. $\times \frac{1}{5}$.

*d.*¹, *d.*², *d.*³ dorsal fins: *a.*¹, *a.*² anal fins: *i.* interspinous rays: *f.* fin rays: *pc.* pectoral girdle: *pv.* pelvic girdle: *h.* hypural bone.

FIG. 2.—SHOULDER GIRDLE, RIGHT HALF, WITH FORE LIMB. $\times \frac{1}{2}$.

c. clavicle: *s.c.* supra-clavicle: *pt.* post-temporal: *pc.* post-clavicle: *s.* scapula: *co.* coracoid: *b.* the four basal pieces: *r.* fin rays.

FIG. 3.—PELVIC GIRDLE AND HIND LIMB. $\times \frac{1}{2}$.

i. left innominate bone, inner aspect: *r.* fin rays.

FIG. 4.—TRUNK VERTEBRA: FRONT VIEW. $\times \frac{1}{2}$.

c. centrum: *p.* neural process: *s.* neural spine.

FIG. 5.—TAIL VERTEBRÆ: LONGITUDINAL SECTION: SHOWING THE LENTICULAR CAVITIES BETWEEN THE CENTRA. $\times \frac{1}{2}$.

FIG. 6.—TAIL VERTEBRA: SIDE VIEW. $\times \frac{1}{2}$.

c. centrum: *p.*¹ neural processes: *s.*¹ neural spine: *p.*² hæmal processes: *s.*² hæmal spine.

Fig.1.

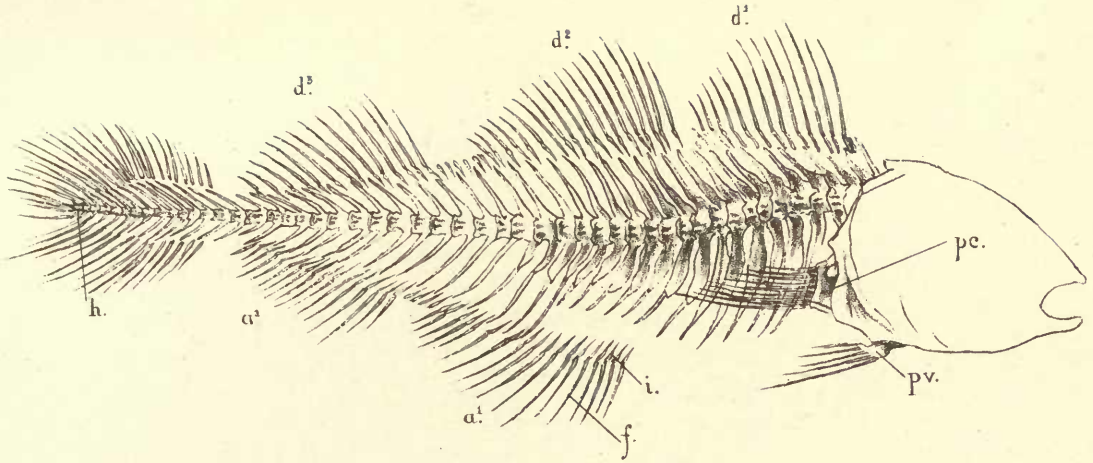


Fig.2.

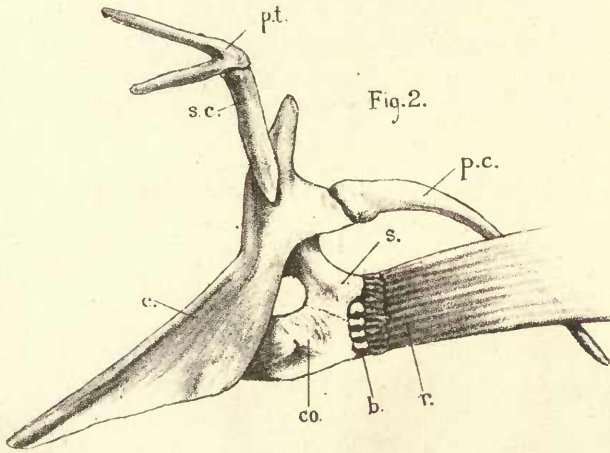


Fig.3.

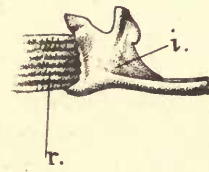


Fig 5.

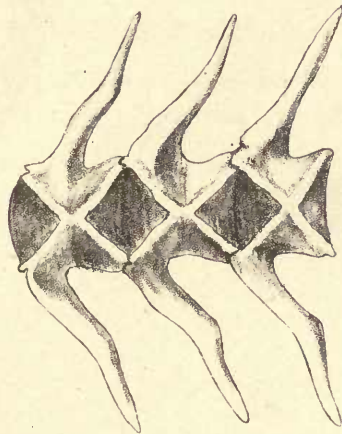


Fig. 4.

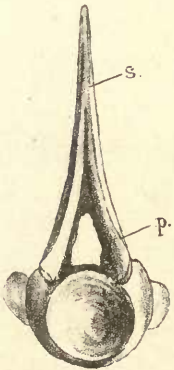


Fig.6.

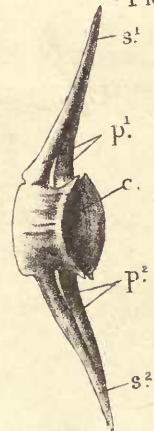


PLATE XLI.

Class—PISCES—continued.

THE COD—continued.

FIG. 1.—SKULL: DORSAL VIEW. $\times \frac{3}{5}$.

FIG. 2.—SKULL: SIDE VIEW. $\times \frac{3}{5}$.

FIG. 3.—BONES OF THE SKULL, DISARTICULATED

- I. *Occipital Segment*.—*b.* basi-occipital: *e.* ex-occipital: *s.* supra-occipital.
- II. *Parietal Segment*.—*ps.* parasphenoid: *a.* alisphenoid: *p.* parietal.
- III. *Frontal Segment*.—*ps.* parasphenoid: *f.* frontal.
- IV. *Pre-frontal Segment*.—*v.* vomer: *pe.* parethmoid: *m.* mesethmoid: *n.* nasal.
- V. *Ear Series*.—*p.o.* prootic: *s.o.* sphenotic: *pt.* pterotic: *e.o.* epiotic: *o.* opisthotic.
- VI. *Eye Series*.—*l.* lachrymal: *s.or.* suborbitals.
- VII., VIIA. *Jaws Series*.—*pm.* premaxilla: *mx.* maxilla: *pl.* palatine: *py.* pterygoid: *ms.* mesopterygoid: *mt.* metapterygoid: *d.* dentary: *ar.* articular: *a.* angular: *q.* quadrate: *sy.* symplectic.
- VIII. *Hyoid Series*.—*h.* hyomandibular: *i.* interhyal: *ep.* epihyal: *cr.* ceratohyal: *hp.* hypohyal: *ur.* urohyal: *br.* branchiostegal rays.
- IX. *Opercular Series*.—*op.* operculum: *p.o.* preoperculum: *i.o.* interoperculum: *s.op.* suboperculum.

Fig. 1.

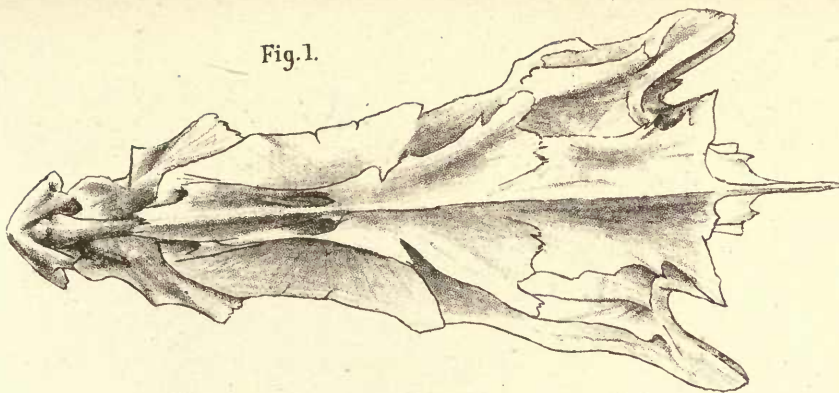


Fig. 2.

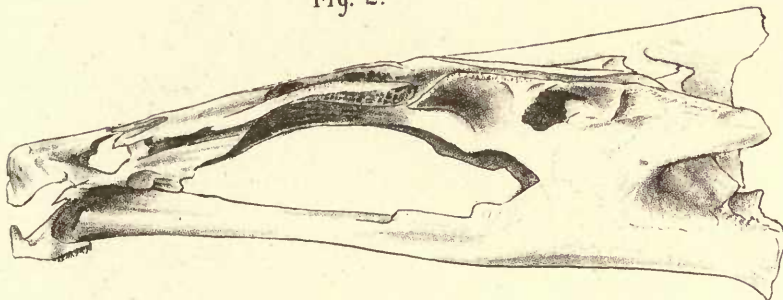


Fig. 3.

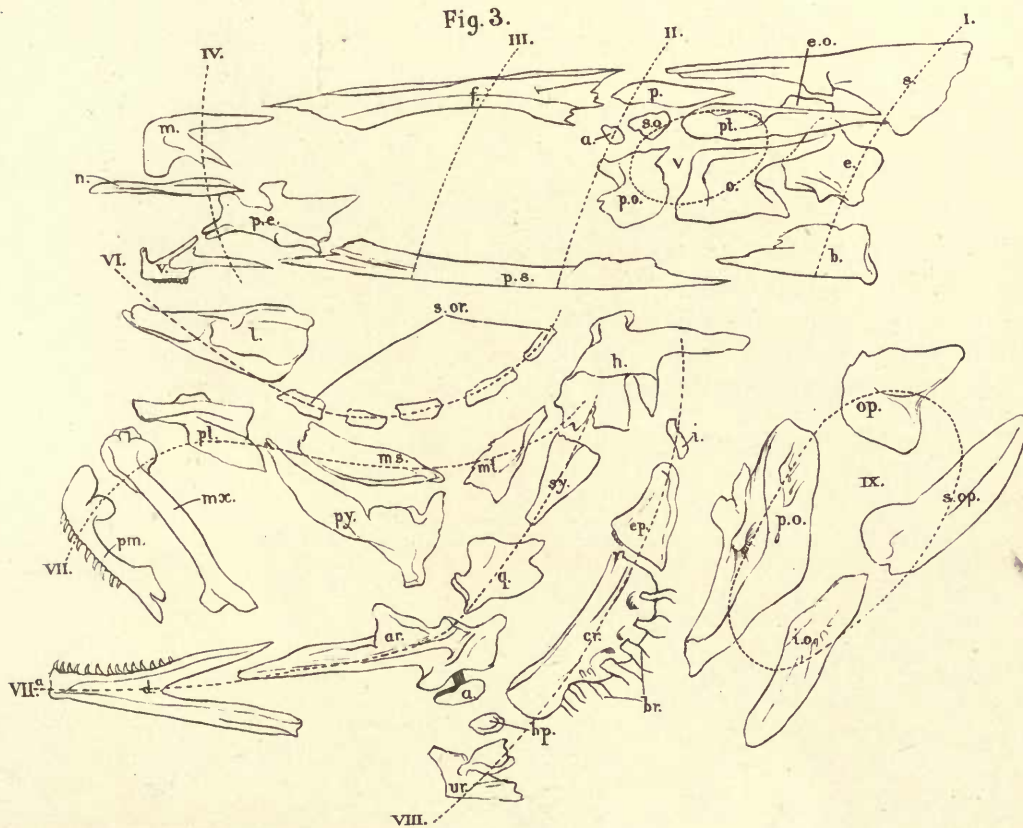


PLATE XLII.

Class—PISCES—*continued*.

THE COD—*continued*.

FIG. 1.—KIDNEY, SWIMBLADDER, AND RIGHT TESTIS: SIDE VIEW. $\times \frac{2}{5}$.

a., p. anterior and posterior cardinal veins in relation to *k.* the kidney: *d.* Cuvierian duct: *b.* swimbladder laid open: *r.* rete mirabile: *c.* posterior portion of the cephalic circle: *a.* dorsal aorta: *s.* spermatic vessel: *t.* testis: *u.* ureter: *bl.* bladder. (Bristles are passed into the openings of the rectum, testes, and bladder.)

FIG. 2.—KIDNEYS AND THEIR BLOOD-VESSELS: VENTRAL VIEW. $\times \frac{2}{5}$.

k., k. kidney: *a.* anterior cardinal vein: *p.* posterior cardinal vein: *d.* Cuvierian duct: *au.* auricle: *v.* ventricle: *ao.* aorta: *c.* caudal vein.

FIG. 3.—TESTES, UNITED POSTERIORLY. $\times \frac{1}{2}$.

FIG. 4.—OVARIES, UNITED POSTERIORLY. $\times \frac{1}{2}$.

Fig.1.

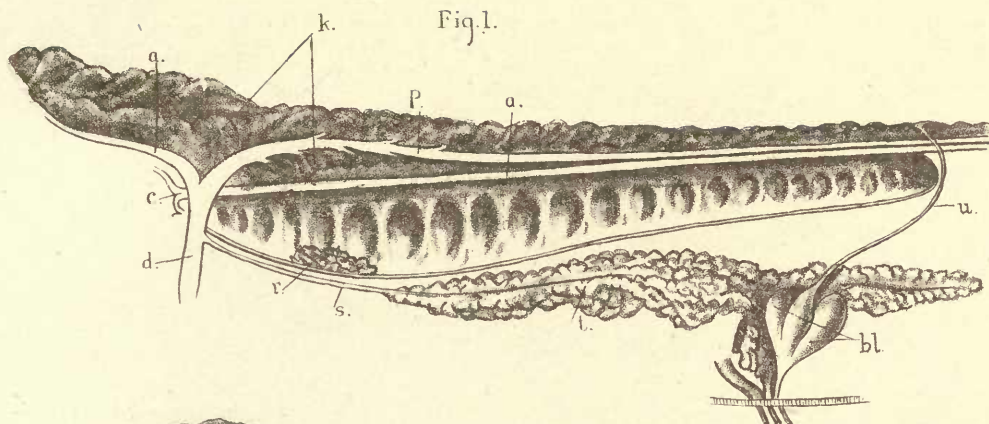


Fig.2.

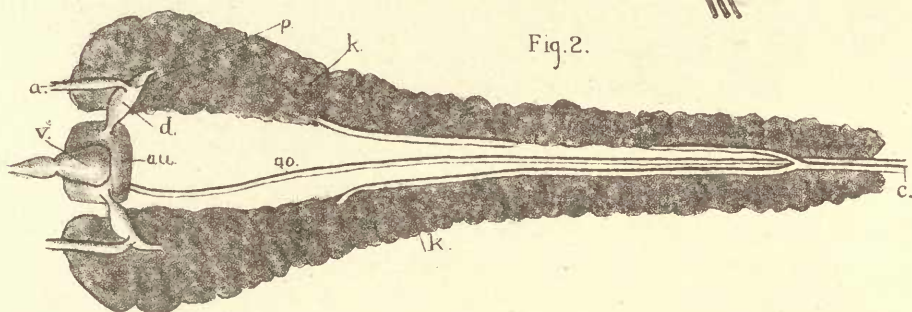


Fig.3.

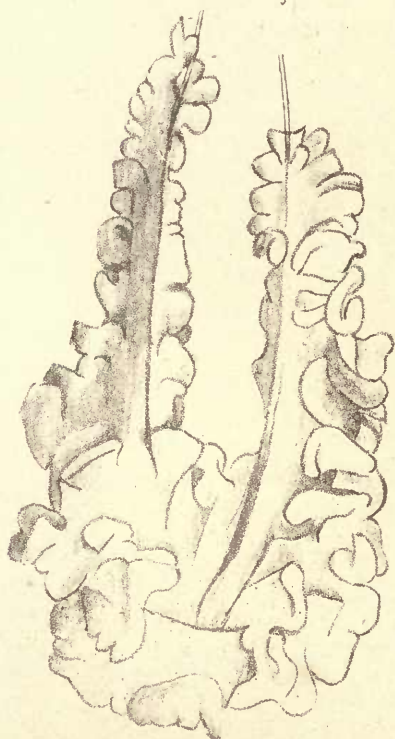


Fig.4.

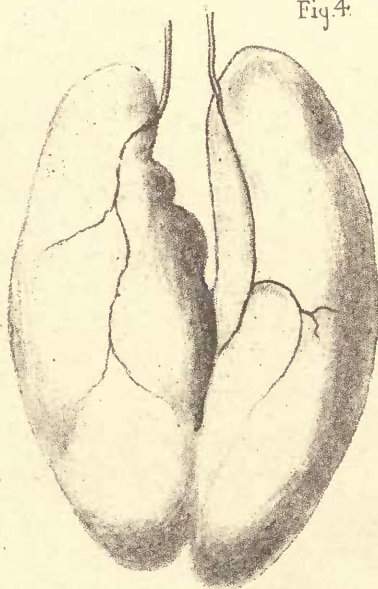


PLATE XLIII.

Class—PISCES—*continued*.

THE COD—*continued*.

FIG. 1.—BRAIN: DORSAL ASPECT. $\times 1$.

cr. cerebral hemispheres: *o. l.* optic lobes: *cm.* cerebellum: *m.* medulla oblongata: *o.* olfactory bulbs: I.-X. the various cranial nerves.

FIG. 2.—BRAIN: VENTRAL ASPECT. $\times 1$.

cr. cerebral hemispheres: *p.* pituitary body: *i.* infundibulum: *l. i.* lobi inferiores: *m.* medulla oblongata: I.-X. the various cranial nerves.

FIG. 3.—BRAIN: SIDE VIEW. $\times 1$.

cr. cerebral hemispheres: *o.* optic lobes: *cm.* cerebellum: *m.* medulla oblongata: *p.* pituitary body: *l. i.* lobi inferiores: I.-X. the various cranial nerves.

FIG. 4.—BRAIN: LONGITUDINAL VERTICAL SECTION. $\times 1$.

cr. cerebral hemispheres: *v.*³ third ventricle: *a.* aqueduct of Sylvius: *cm.* cerebellum: *v.*⁴ fourth ventricle: *p.* pituitary body: *in.* infundibulum: *c. c.* crura cerebri: *cms.* commissure between the posterior lobes: *m.* medulla oblongata.

FIG. 5.—EYE: WITH ITS MUSCLES ATTACHED, AND THE OPTIC NERVE (*n*). $\times 1$.

FIG. 6.—EAR. $\times 1$.

a., p., h. anterior, posterior and horizontal semicircular canals: *a.*¹, *a.*², *a.*³ ampullæ: *v.* vestibule: *o.*¹, *o.*² otoliths.

Fig. 1.

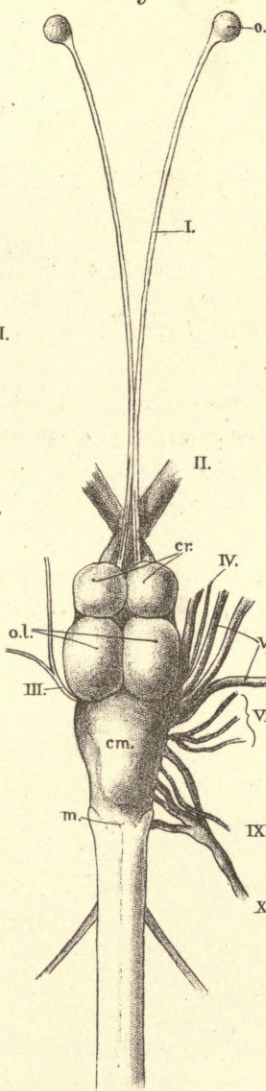


Fig. 2.

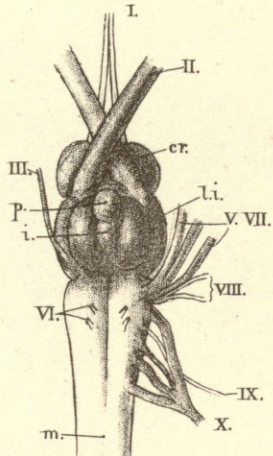


Fig. 3.

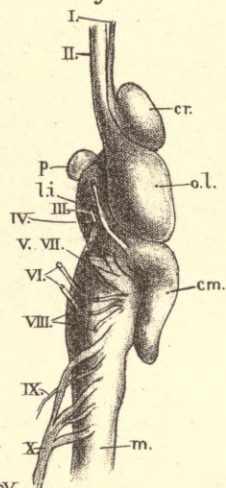


Fig. 4.

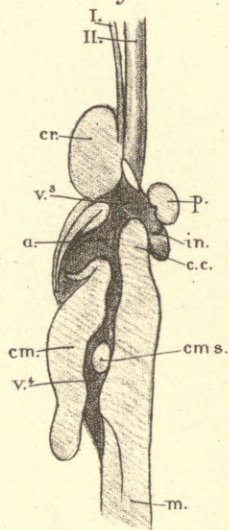


Fig. 5.

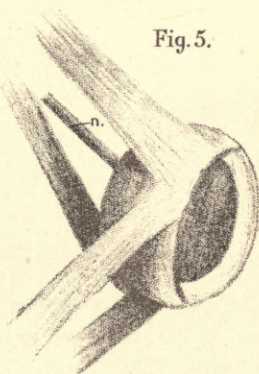


Fig. 6.

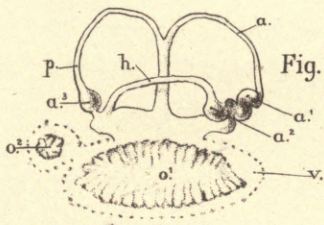


PLATE XLIV.

Class—AMPHIBIA.

THE FROG (*Rana temporaria*).

FIG. 1.—FROG. $\times 1$.

n. external nares: *e.* eye: *t.* tympanic membrane: *b.* brachium:
a. b. antibrachium: *m.* manus: *s.* sacral hump: *f.* femur:
c. crus: *p.* pes.

FIG. 2.—HEAD: DORSAL VIEW. $\times 1\frac{1}{2}$.

n. external nares: *e.* eye: *t.* tympanic membrane.

FIG. 3.—HAND OF MALE FROG DURING THE BREEDING SEASON. $\times 2$.

c. cushion: II.-V. the four digits.

FIG. 4.—HAND OF FEMALE FROG. $\times 2$.

II.-V. the four digits.

FIG. 5.—PES: DORSAL VIEW. $\times 2$.

w. web: I.-V. the digits.

FIG. 6.—ROOF OF THE MOUTH. $\times 2$.

t. teeth on the maxilla and premaxilla: *v.* vomerine teeth: *n.* internal nares: *e.* Eustachian opening.

FIG. 7.—FLOOR OF THE MOUTH. $\times 2$.

t. tongue: *m.* lower jaw: *g.* glottis.

Fig. 1.

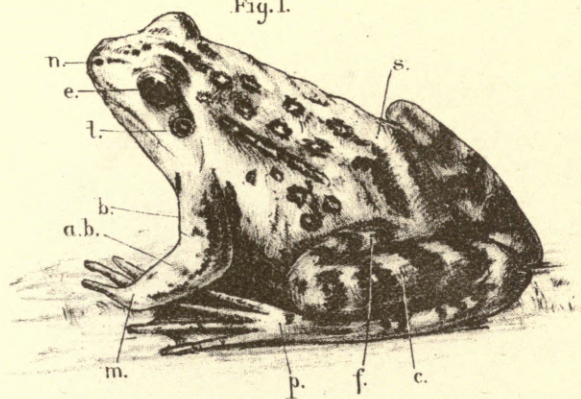


Fig. 2.

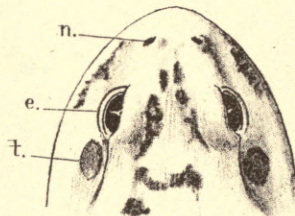


Fig. 3.

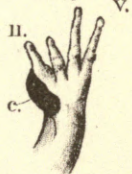


Fig. 4.



Fig. 5.

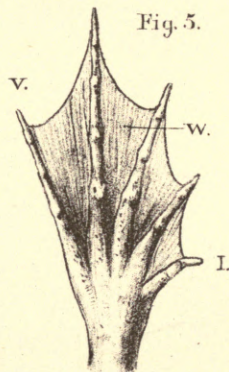


Fig. 6.

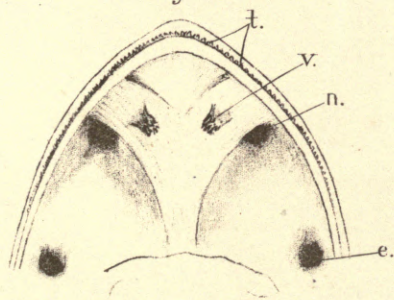


Fig. 7.

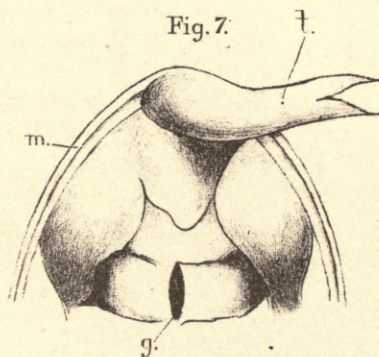


PLATE XLV.

Class—AMPHIBIA—*continued*.

THE FROG—*continued*.

FIG. 1.—VISCERA IN POSITION. $\times 1$.

h. head of the humerus: *a.* aorta: *v.* ventricle with the auricles above it: *lg.*¹, *lg.*² right and left lungs: *l.*¹-*l.*³ lobes of the liver: *g.* gall-bladder: *sp.* spleen: *l.* large intestine: *i.* coils of the small intestine: *b.*¹, *b.*² lobes of the cloacal bladder: *f.* femoral vein: *a. p.* anterior pelvic veins uniting to form the anterior abdominal vein: *t.* left testis: *s.* stomach: *dn.* duodenum.

FIG. 2.—LIVER AND STOMACH. $\times 1\frac{1}{2}$.

*l.*¹-*l.*³ lobes of the liver: *g.* gall-bladder: *b.* bile duct: *p.* outline of the pancreas: *s.* stomach: *py.* pylorus: *dn.* duodenum.

FIG. 3.—ALIMENTARY TRACT. $\times 1$.

æ. œsophagus: *s.* stomach laid over to the right side: *p.* pancreas: *sp.* spleen: *i.* coils of the small intestine: *r.* rectum.

FIG. 4.—TRANSVERSE SECTION OF THE LUNG. $\times 3$.

FIG. 5.—TRANSVERSE SECTION OF THE STOMACH. $\times 4$.

FIG. 6.—TRANSVERSE SECTION OF THE SMALL INTESTINE. $\times 4$.

Fig. 1.

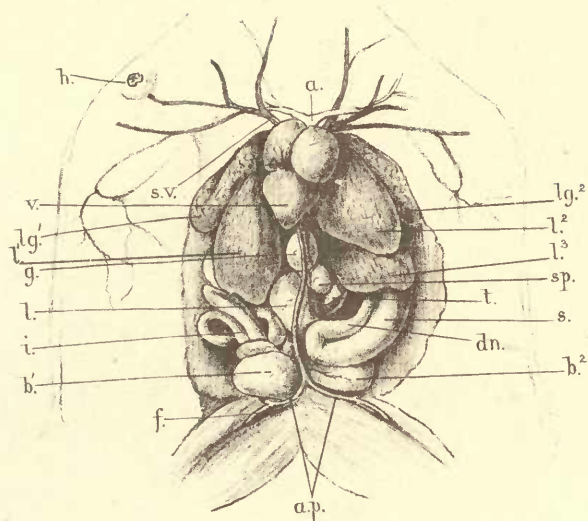


Fig. 2.

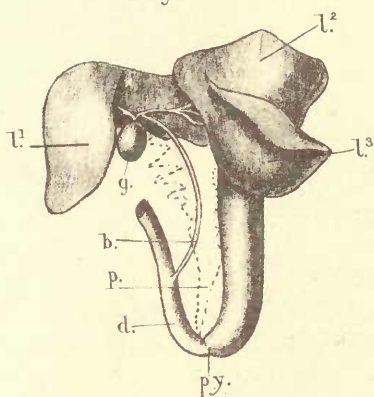


Fig. 3.

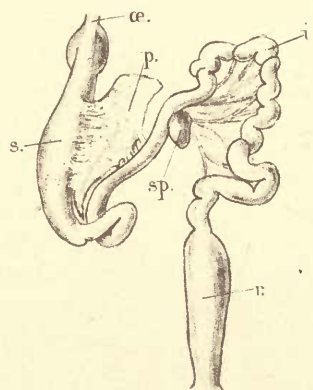


Fig. 5.



Fig. 4.



Fig. 6.



PLATE XLVI.

Class—AMPHIBIA—*continued*.

THE FROG—*continued*.

FIG. 1.—HEART AND ARTERIAL SYSTEM. × 2.

- a.*¹, *a.*² right and left auricles constituting the atrium: *ve.* ventricle:
t. truncus arteriosus.
p. pulmo-cutaneous arch: *p. a.* pulmonary artery: *c. a.* cutaneous
artery.
s. systemic arch: *v.* occipito-vertebral artery: *s. a.* subelavian artery:
c.m. coeliaco-mesenteric artery: *cl.* coeliac artery: *s. m.*
(superior) mesenteric artery: *d.* dorsal aorta: *sp.* spermatic
artery to *ts.* testis: *r.* renal arteries to *k.* kidney: *i.* iliac artery.
c. carotid arch: *g.* carotid gland: *l.* lingual artery: *cr.* common
carotid artery.

FIG. 2.—BLOOD: NUCLEATED CORPUSCLES. × 300.

FIG. 3.—DIAGRAM OF THE HEART.

- r.* right auricle: *l.* left auricle: *v.* ventricle: *t.* truncus arteriosus.—
The dotted arrow shows the communication between the
right side and the pulmo-cutaneous arches, the plain arrow
between the left side and the two other pairs of arches.

FIG. 4.—DISSECTION OF THE HEART FROM THE VENTRAL ASPECT.—(From
Howes.) × 6.

- a.*¹ right auricle with the opening from the sinus venosus: *a.*² left
auricle with the opening of the pulmonary vein: *ve.* ventricle:
p. pylangium with opening into pulmo-cutaneous trunks:
v. valve: *s.* synangium: *c.* carotid arch: *sy.* systemic arch:
p.c. pulmo-cutaneous arch.

Fig. 1.

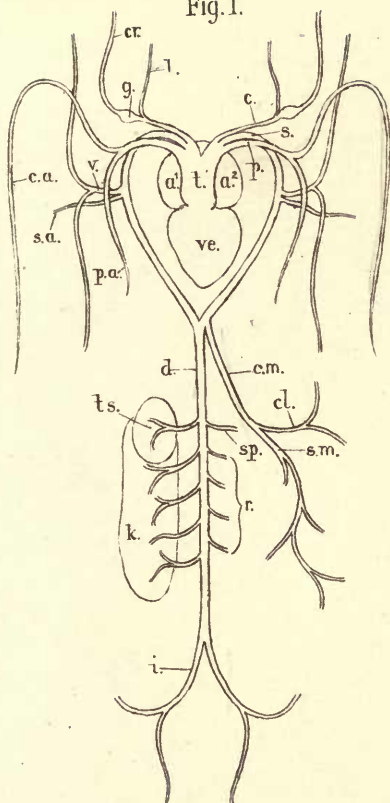


Fig. 2.



Fig. 4.

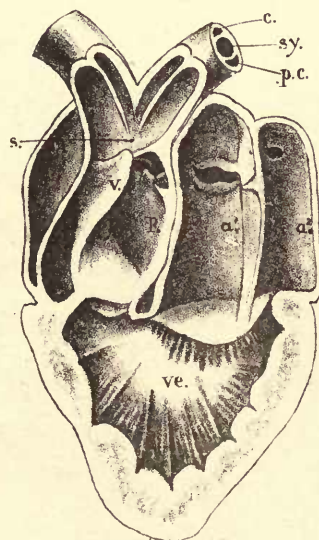


Fig. 3.

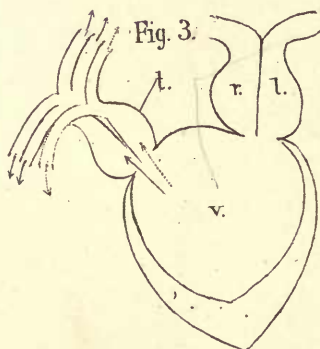


PLATE XLVII.

Class—AMPHIBIA—*continued*.

THE FROG—*continued*.

FIG. 1.—VENOUS SYSTEM. $\times 2$.

- l.* lingual vein : *m.* mandibular vein : *e.j.* external jugular vein :
i. internal jugular vein : *s.* subscapular vein : *in.* innominate
vein : *b.* brachial vein : *m.* musculo-cutaneous vein : *s.v.*
subclavian vein : *v.c.* right superior vena cava : *s.v.* sinus
venosus.
f. femoral vein : *a.* anterior pelvic vein : *v.* vesicular or cystic vein :
a.a. anterior abdominal vein : *c.* cardiac vein : *lr.* liver.
p. posterior pelvic vein : *sc.* sciatic vein : *r.p.* renal-portal or
common iliac vein : *d.* dorso-lumbar vein : *k.* kidney : *r.* renal
veins : *v.c.i.* inferior vena cava.

FIG. 2.—HEART : VENTRAL VIEW. $\times 2$.

- a.* aortic arches : *v.¹, v.²* right and left superior venæ cavæ.

FIG. 3.—HEART : DORSAL VIEW. $\times 2$.

- v.¹, v.²* right and left superior venæ cavæ : *p.* pulmonary vein : *v.³*
inferior vena cava : *h.¹, h.²* hepatic veins : *s.* sinus venosus.

FIG. 4.—LUNGS AND HEART : VENTRAL VIEW. $\times 2$.

- a.* aortic arches : *c.a.* carotid arch : *l.* lingual artery : *g.* carotid
gland : *cr.* carotid artery : *s.* systemic arch : *p.c.* pulmo-
cutaneous arch : *c.* cutaneous artery : *p.* pulmonary artery :
lg. lung.

Fig. 1.

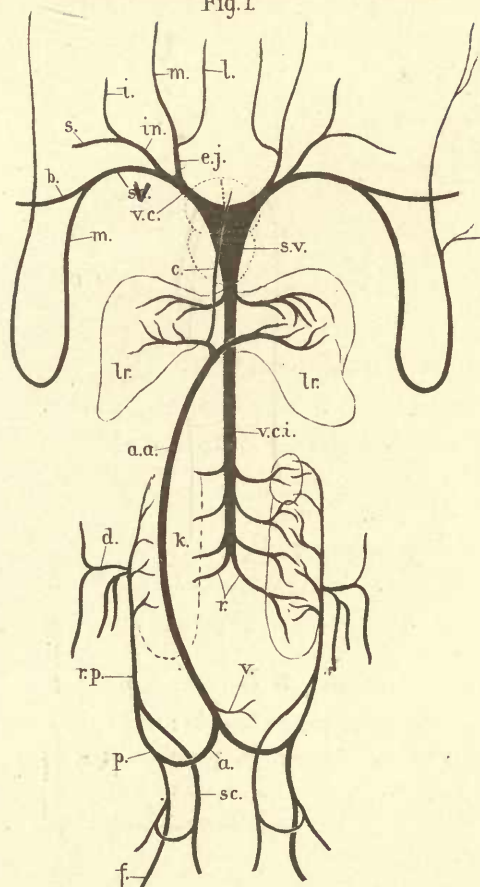


Fig. 2.

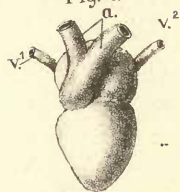


Fig. 3.

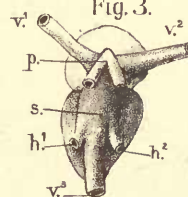
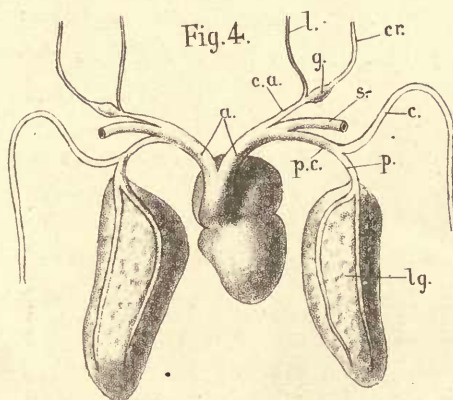


Fig. 4.



Class—AMPHIBIA—*continued*.

THE FROG—*continued*.

FIG. 1.—VERTEBRAL COLUMN: DORSAL VIEW. $\times 1\frac{1}{2}$.

I.-VIII. first to eighth vertebræ: IX. ninth vertebra or "sacrum":
us. urostyle. The pelvic girdle is shown in outline.

FIG. 2.—SINGLE VERTEBRÆ. $\times 2$.

I.¹-I.¹¹ first or atlas vertebra: III.¹-III.¹¹ third vertebra: VIII.¹-
VIII.¹¹ eighth vertebra: IX.¹-IX.¹¹ ninth or sacral
vertebra.

FIG. 3.—SKULL: VENTRAL VIEW. $\times 2$.

e.o. ex-occipital: *p.s.* parasphenoid: *s.e.* sphenethmoid: *pl.* palatine:
q.j. quadrato-jugal: *pt.* pterygoid: *s.* squamosal: *m.* maxilla:
p.m. premaxilla: *v.* vomer: IV., II., III., V.-VII., IX., X.
foramina for the various cranial nerves.

FIG. 4.—SKULL: DORSAL VIEW. $\times 2$.

e.o. ex-occipital: *o.c.* occipital condyle: *p.o.* pro otic: *p.f.* parieto-
frontal: *s.e.* sphenethmoid: *n.* nasal: *p.m.* premaxilla: *m.*
maxilla: *q.j.* quadrato-jugal: *s.* squamosal: *pt.* pterygoid.

FIG. 5.—HYOID BONE. $\times 2$.

h. body of the hyoid: *a.* anterior cornu: *p.* posterior cornu (thyro-
hyal).

FIG. 6.—SKULL, LOWER JAW, AND HYOID: SIDE VIEW. $\times 2$.

p.f. parieto-frontal: *s.e.* sphenethmoid: *n.* nasal: *p.m.* premaxilla:
m. maxilla: *q.j.* quadrato-jugal: *pt.* pterygoid: *s.* squamosal:
a.s. angulo-splénial: *d.* dentary: *m.m.* mento-meckelian:
h. body of the hyoid: *a.* anterior cornu: *p.* posterior cornu.

FIG. 7.—SKULL: POSTERIOR VIEW. $\times 2$.

f.m. foramen magnum: *o.c.* occipital condyle: *q.j.* quadrato-jugal:
c.m. mandibular condyle.

Fig. 1.

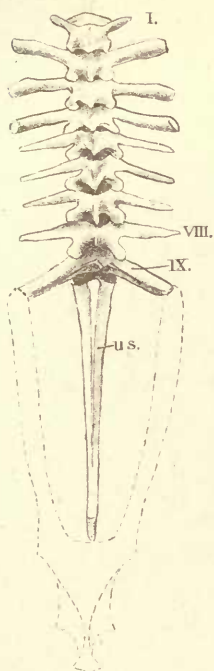


Fig. 2.

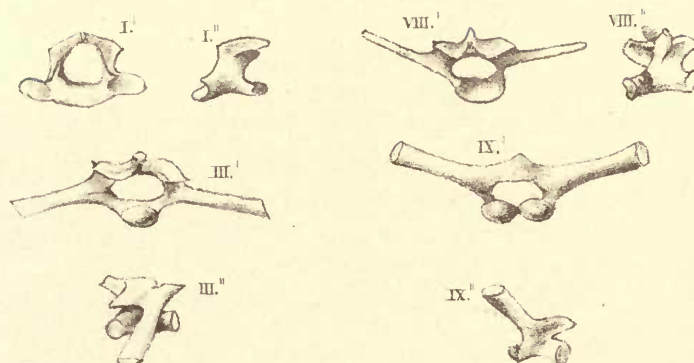


Fig. 3.

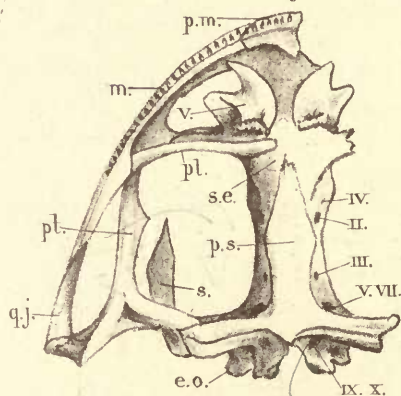


Fig. 4.

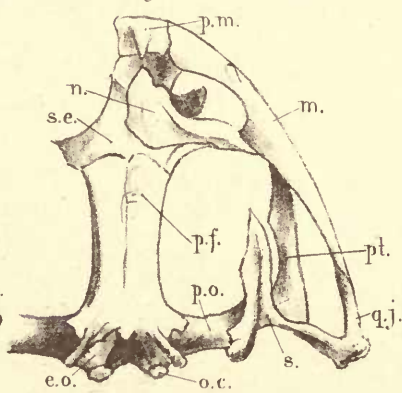


Fig. 5.

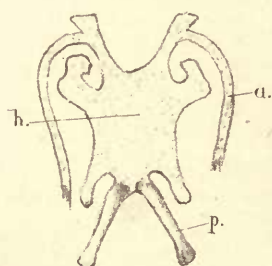


Fig. 6.

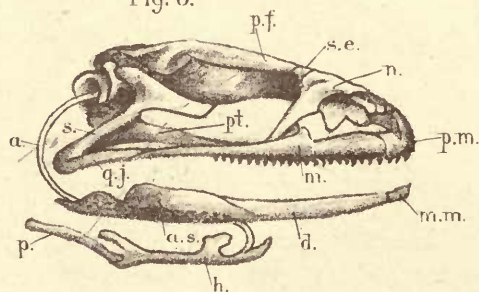


Fig. 7.



Class—AMPHIBIA—*continued*.

THE FROG—*continued*.

FIG. 1.—FORE LIMB. $\times 2$.

h. humerus: *r.* radius and *u.* ulna, fused: *c.* carpal bones; *m.* metacarpal bones: II.-V. phalanges of the second to the fifth digits.

FIG. 2.—HUMERUS. $\times 2$.

FIG. 3.—ULNA AND RADIUS. $\times 2$.

o. olecranon: *c.* carpal articulation.

FIG. 4.—HIND LIMB. $\times 1$.

f. femur: *t.* tibia and *fl.* fibula, fused: *a.* astragalus and *o.* os calcis, fused at their extremities: *tr.* distal row of tarsal bones: *c.* calcar: *m.* metatarsals: I.-V. phalanges of the five digits.

FIG. 5.—TRANSVERSE SECTION THROUGH THE TIBIA AND FIBULA. $\times 3$.

FIG. 6.—FEMUR. $\times 1\frac{1}{2}$.

FIG. 7.—TIBIA AND FIBULA. $\times 1\frac{1}{2}$.

FIG. 8.—PROXIMAL TARSAL BONES. $\times 1\frac{1}{2}$.

a. astragalus: *o.* os calcis.

FIG. 9.—LEFT OS INNOMINATUM. $\times 2$.

il. ilium: *is.* ischium: *p.* pubes: *a.* acetabulum.

FIG. 10.—PELVIC GIRDLE: DORSAL VIEW. $\times 2$.

il. ilium: *is.* ischium: *a.* acetabulum: *us.* urostyle.

FIG. 11.—PECTORAL GIRDLE: VENTRAL VIEW, THE LEFT SUPRASCAPULA BEING LAID OUT. $\times 2\frac{1}{2}$.

x. xiphisternum: *s.* sternum: *e.c.* epicoracoid: *o.* omosternum: *e.* episternum: *pt.c.* postcoracoid: *c.* clavicle: *g.* glenoid cavity: *sc.* scapula: *s.sc.* suprascapula.

FIG. 12.—CLAVICLE IN ITS RELATION TO THE CORACOID. $\times 3$.

o. omosternum: *c.* clavicle: *p.c.* præcoracoid: *pt.c.* postcoracoid.

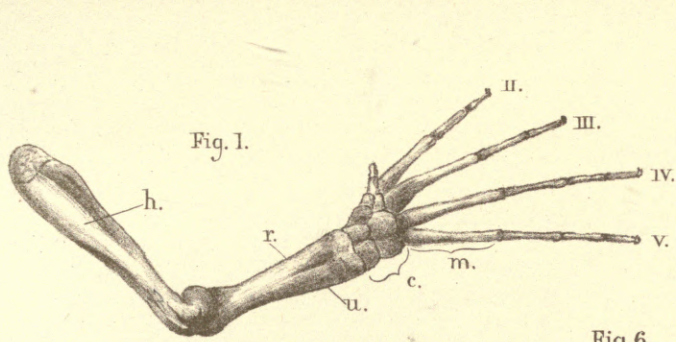


Fig. 2.



Fig. 3.

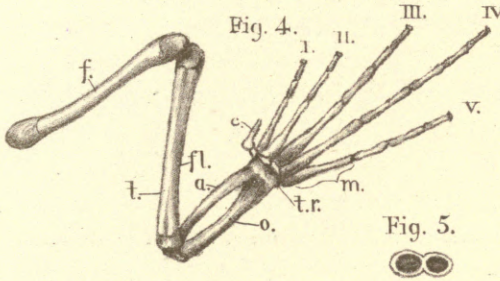


Fig. 5.



Fig. 6.



Fig. 7.



Fig. 8.

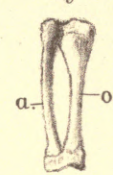


Fig. 9.

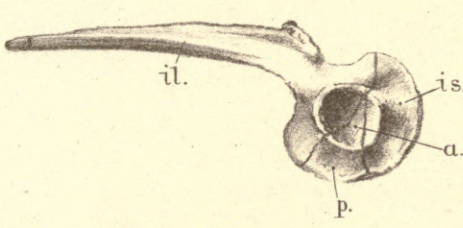


Fig. 10.

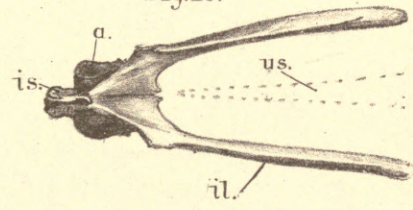


Fig. 11.

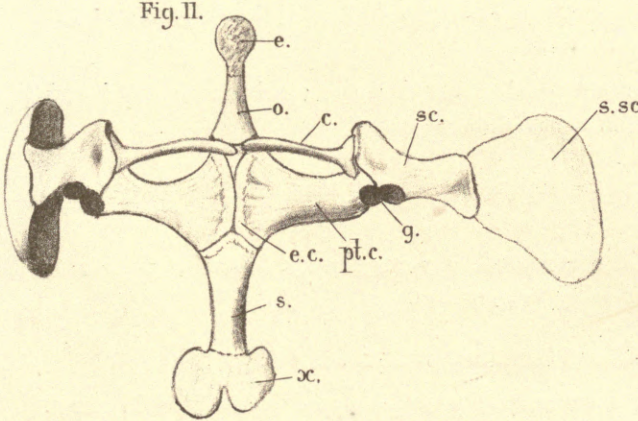
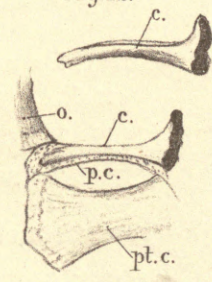


Fig. 12.



Class—**AMPHIBIA**—*continued*.

THE FROG—*continued*.

FIG. 1.—CEREBRO-SPINAL AND SYMPATHETIC NERVOUS SYSTEMS: VENTRAL VIEW.
× 2.

I. olfactory nerve to the olfactory bulb: II. optic nerve to the eye:
X. tenth cranial nerve: 2. second spinal nerve (brachial):
s. sciatic nerve: s.¹ one of the sympathetic ganglia.

FIG. 2.—BRAIN: DORSAL VIEW. × 5.

ol. olfactory lobes: c. cerebral lobes: p. pineal body: t. optic thalamus:
o. optic lobes: cm. cerebellum: IV. roof of the fourth ventricle:
m. medulla oblongata.

FIG. 3.—BRAIN: VENTRAL VIEW. × 5.

o. c. optic commissure: i. infundibulum: p. pituitary body: I.-XI.
the various cranial nerves.

FIG. 4.—BRAIN: SIDE VIEW. × 5.

ol. olfactory lobe: c. cerebral lobe: p. pineal body: o. optic lobe:
cm. cerebellum: m. medulla oblongata: o. t. optic tract:
i. infundibulum with pituitary body attached.

FIG. 5.—BRAIN: LONGITUDINAL AND VERTICAL MESIAL SECTION BEHIND THE
CEREBRAL LOBES. × 5.

c. optic chiasma: v.³ third ventricle: cm. cerebellum: v.⁴ fourth
ventricle: m. medulla oblongata.

FIG. 6.—BRAIN: LONGITUDINAL HORIZONTAL SECTION SHOWING THE VENTRICLES.
× 5.

I., II., III., IV. the corresponding ventricles: f. foramen of Monro:
i. aqueduct of Sylvius, or iter.

FIG. 7.—DISSECTION OF THE LEFT SIDE OF THE HEAD. × 3.

e. eye: t. tongue: s. squamosal bone: h. hyoid bone: V. fifth nerve
(trigeminal): VII. seventh nerve (facial): X. tenth nerve
(pneumogastric or vagus): s.¹ first spinal nerve (hypoglossal)

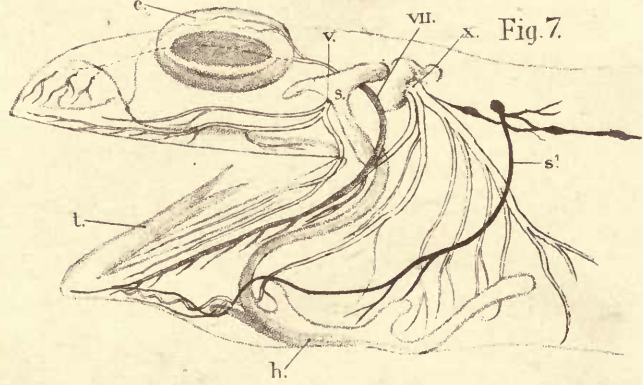
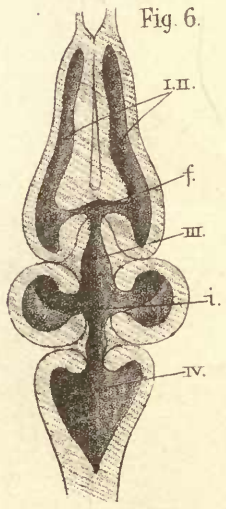
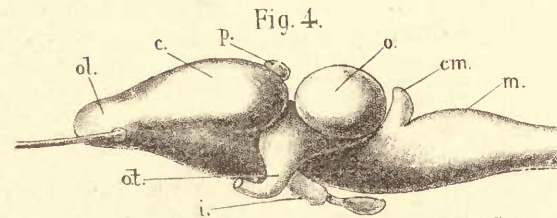
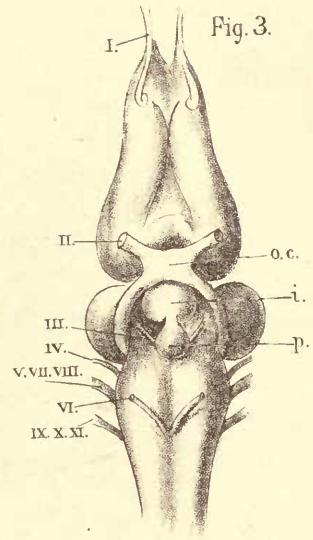
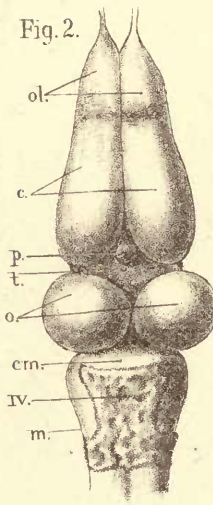
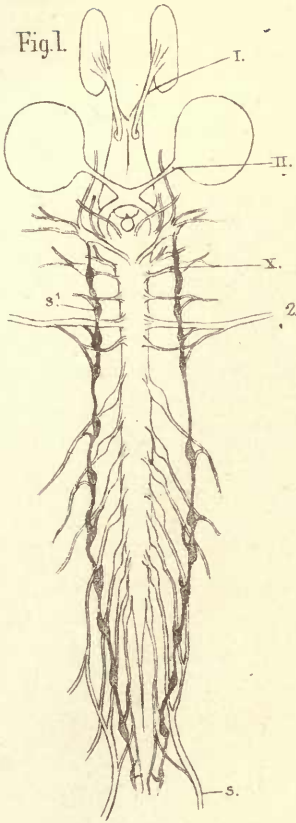


PLATE LI.

Class—AMPHIBIA—*continued.*

THE FROG—*continued.*

FIG. 1.—URINO-GENITAL SYSTEM: MALE. $\times 2$.

t. testis: *c.* corpus adiposum: *e.* vasa efferentia: *k.* kidney: *a.* adrenal: *u.* urino-genital duct: *s.* seminal vesicle: *r.* rectum: *b.* bladder.

FIG. 2.—URINO-GENITAL SYSTEM: FEMALE. $\times 1\frac{1}{2}$.

o. ovary: *c.* corpus adiposum: *æ.* œsophagus: *o.d.* oviduct: *k.* kidney: *a.* adrenal: *u.* ureter: *b.* bladder: *r.* rectum. (The left ovary and corpus adiposum have been removed to expose the kidney.)

FIG. 3.—STAGES IN THE DEVELOPMENT OF THE FROG.

In figs. *a.* to *h.* the epiblast is shown by dark shading, the hypoblast by light.

Fig. 1.

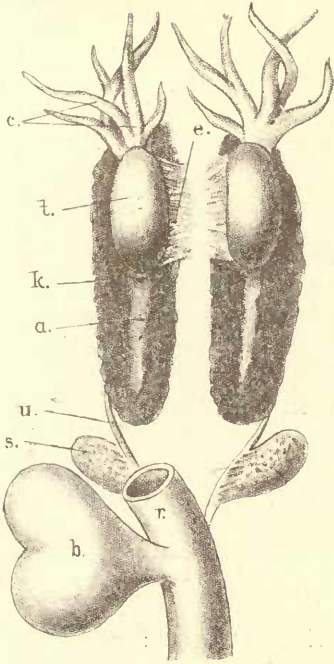


Fig. 2.

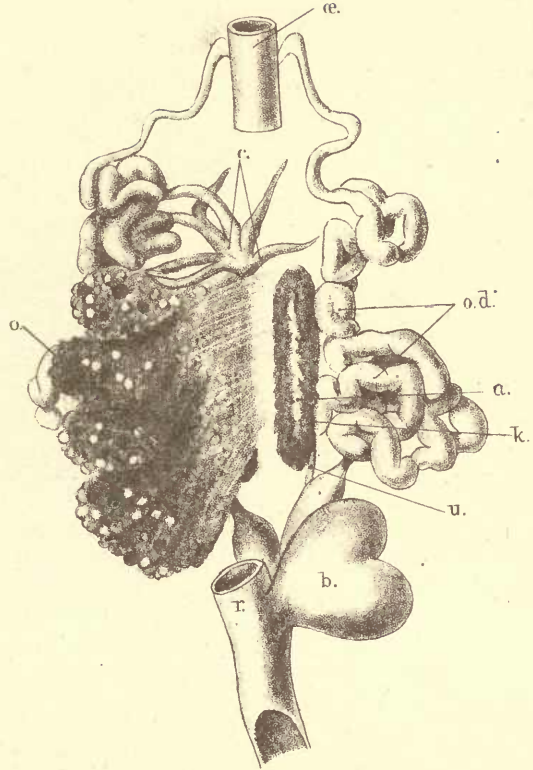


Fig. 3.

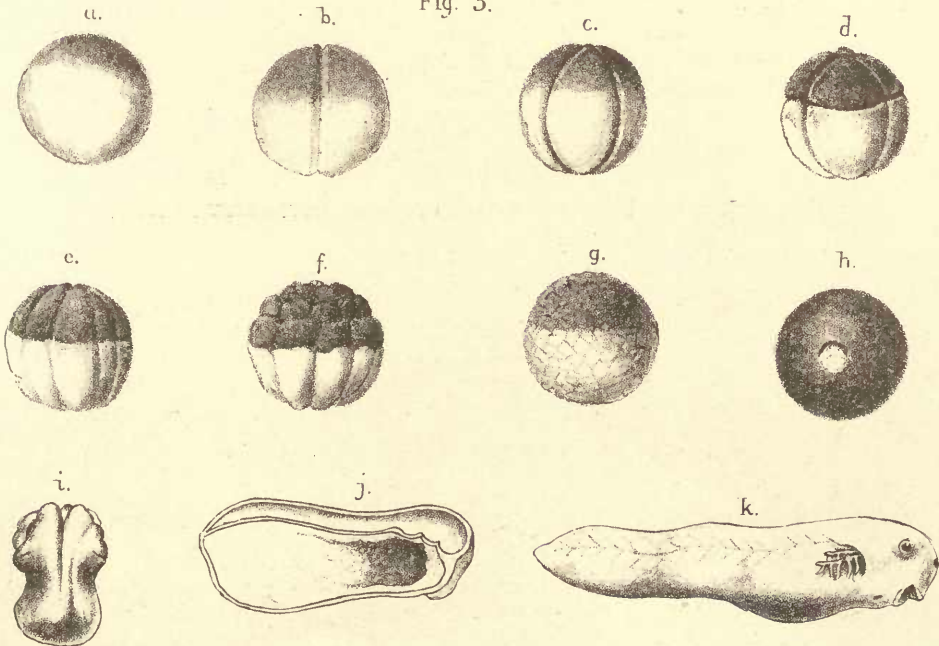


PLATE LII.

Class—REPTILIA.

THE GREEN LIZARD (*Lacerta viridis*).

FIG. 1.—GREEN LIZARD. $\times 1$.

FIG. 2.—ALIMENTARY SYSTEM. $\times 1$.

st. stomach : *p.* pancreas : *s.* spleen : *i.* intestine : *r.* rectum : *l.* liver :
lg. lung.

FIG. 3.—HEART. $\times 1\frac{1}{2}$.

*a.*¹ right auricle : *a.*² left auricle : *v.* ventricular portion : *ao.* aortic
arches.

FIG. 4.—LACERTA MURIALIS : HEART AND GREAT VESSELS : SLIGHTLY
DIAGRAMMATIC.

j. jugular vein : *s.* subclavian vein : *p.* pulmonary vein : *i.* inferior
vena cava : *c.* carotid arches : *c. a.* carotid artery : *d.* ductus
Botalli : *v.* pulmonary vein : *l. a.* left aortic arch : *s. a.*
subclavian artery : *d. o.* dorsal aorta.

FIG. 5.—GREEN LIZARD : POSTERIOR PART OF THE CIRCULATORY SYSTEM. $\times 1$.

a. dorsal aorta : *c. m.* cœliaco-mesenteric artery : *i. m.* inferior
mesenteric arteries : *f. a.* femoral artery : *c.* caudal artery and
vein : *f.* femoral vein : *s.* sciatic vein : *p.* pelvic vein : *e.*
epigastric vein : *t.* testis : *i.* inferior vena cava.

Fig.1.

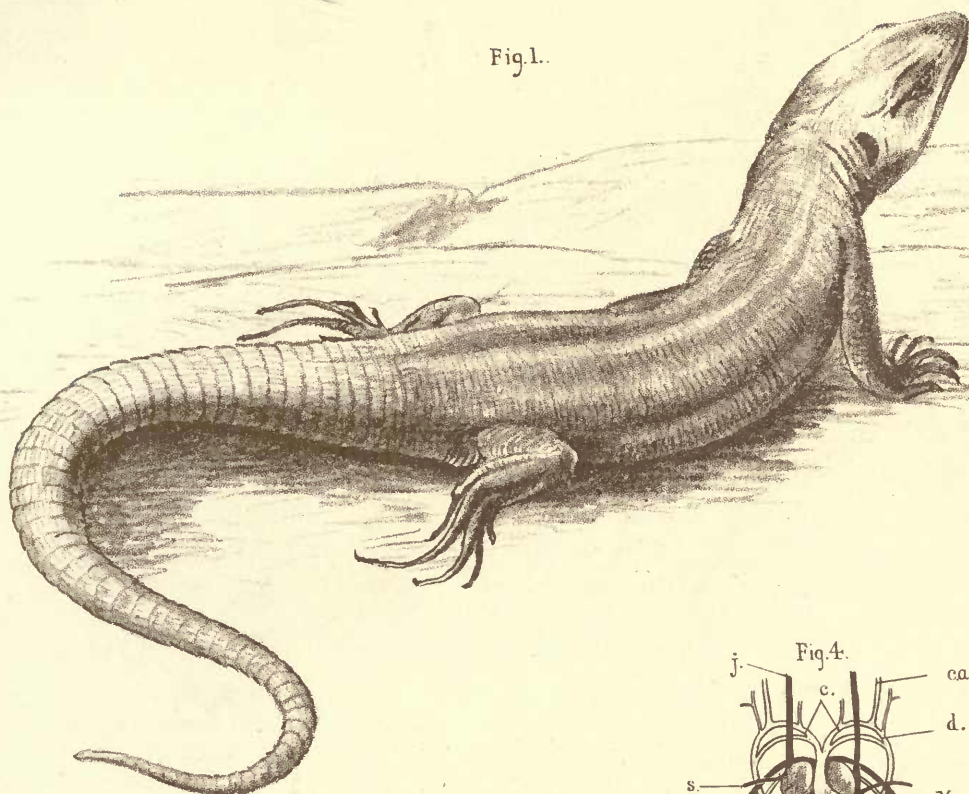


Fig.2.

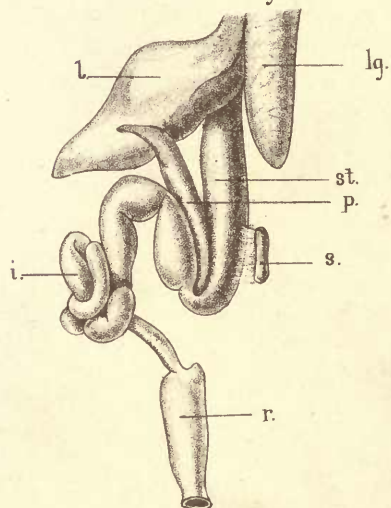


Fig.3.

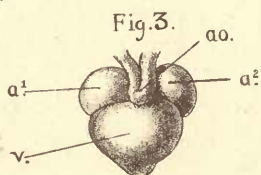


Fig.4.

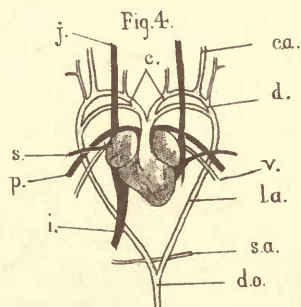


Fig.5.

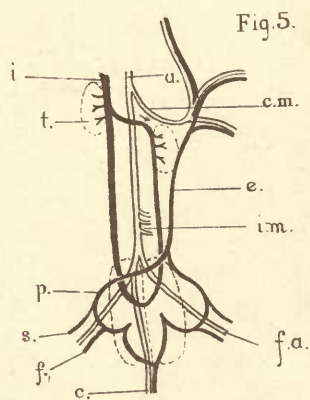


PLATE LIII.

Class—REPTILIA—*continued*.

THE LIZARD—*continued*

FIG. 1.—SKELETON. Slightly reduced.—(Partly after Blanchard.)

p. parietal: *f.* frontal: *n.* nasal: *pm.* premaxilla: *m.* maxilla:
j. jugal: *l.* lachrymal: *d.* dentary: *s.s.* suprascapula: *sc.*
scapula: *h.* humerus: *s.* sternum: *s. r.* sternal ribs: *i.* ilium:
is. ischium: *pb.* pubes: *fm.* femur.

FIG. 2.—BONES OF THE FORE ARM AND HAND. $\times 1$.

r. radius: *u.* ulna: *c.* carpals: *m.* metacarpals: I.-V. digits with
alanges.

FIG. 3.—BONES OF THE LEG AND FOOT. $\times 1$.

t. tibia: *f.* fibula: *ts.* tarsals: *m.* metatarsals: I.-V. digits with
phalanges.

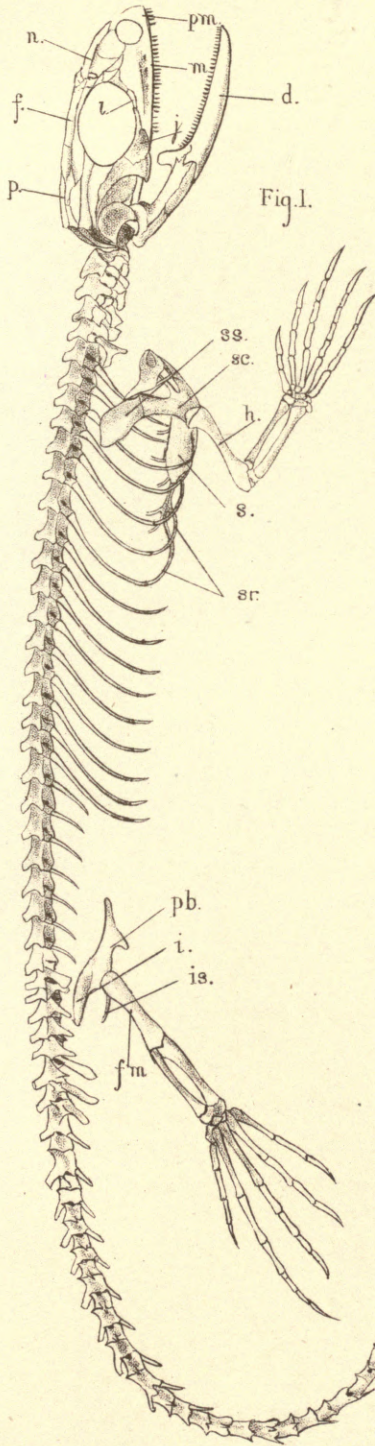


Fig. 2.

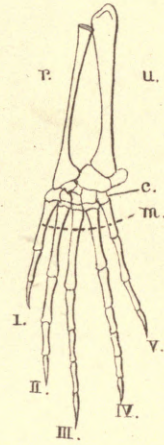


Fig. 3.

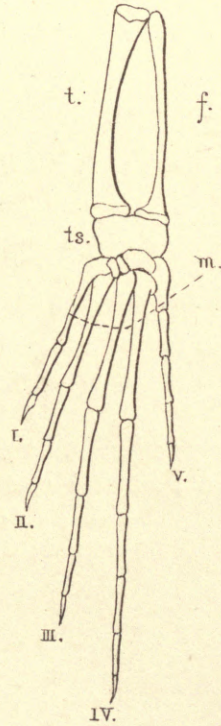


PLATE LIV.

Class—REPTILIA—*continued*.

THE LIZARD—*continued*.

FIG. 1.—BRAIN : DORSAL ASPECT. $\times 2\frac{1}{2}$.

o. olfactory lobes : *c.* cerebral lobes : *p.* pineal body : *o. l.* optic lobes :
cm. cerebellum : *m.* medulla oblongata.

FIG. 2.—BRAIN : VENTRAL ASPECT. $\times 2\frac{1}{2}$.

o. olfactory lobes : *c.* cerebral lobes : *o. c.* optic chiasma : *i.* infundibulum : *p.* pituitary body : II.-XII. the various cranial nerves.

FIG. 3.—BRAIN : SIDE VIEW. $\times 2\frac{1}{2}$.

o. olfactory lobe : *c.* cerebral lobe : *p.* pineal body : *cm.* cerebellum :
m. medulla oblongata : *i.* infundibulum : *py.* pituitary body :
II.-VI. the various cranial nerves.

FIG. 4.—URINO-GENITAL SYSTEM : MALE. $\times 1$.

t. testes : *m.* mesorchium : *e.* epididymis : *r.* rectum : *b.* bladder :
k. kidney : *p.* copulatory organs.

FIG. 5.—URINO-GENITAL SYSTEM : FEMALE. $\times 1$.

o. peritoneal opening of the oviduct : *od.* oviduct : *ov.* ovary : *k.* kidney : *o.¹* cloacal opening of the oviduct : *u.* opening of the ureter into the cloaca.

Fig.1.

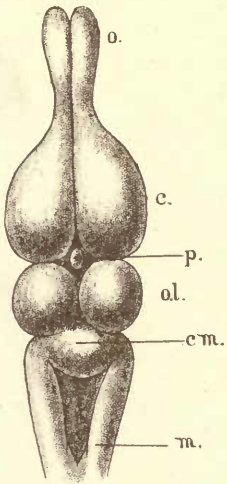


Fig.2.

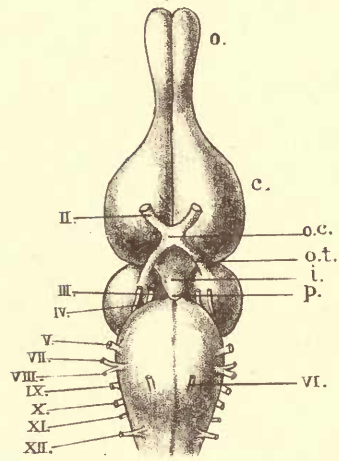


Fig.3.

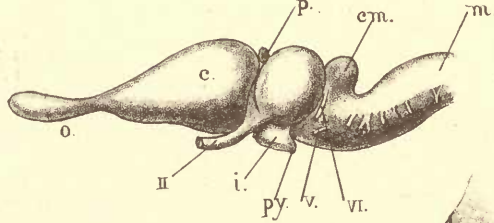


Fig 5.

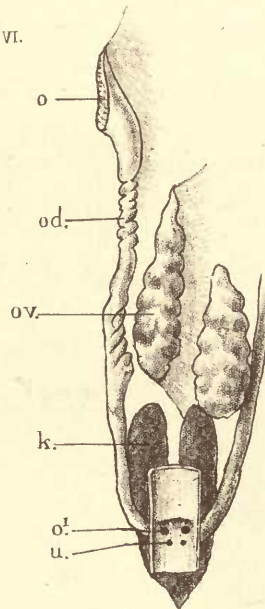


Fig.4.

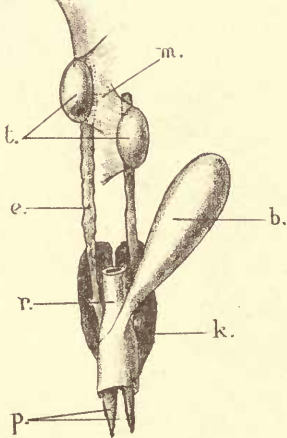


PLATE LV.

Class—AVES.

THE PIGEON (*Columba*).

FIG. 1.—PIGEON. $\times \frac{1}{2}$.

FIG. 2.—HEAD. $\times 1$.

a. auditory opening : *c.* cere : *n.* nostril.

FIG. 3.—FEATHER : VENTRAL ASPECT. $\times 1$.

c. calamus or tube, and *r.* rachis or shaft, constituting the scapus or stem : *v.* vane composed of barbs : *i.* inferior umbilicus : *s.* superior umbilicus.

FIG. 4.—PART OF A FEATHER. $\times 15$.

r. rachis : *b.* barb : *br.* barbules with hooklets attached.

Fig.1.

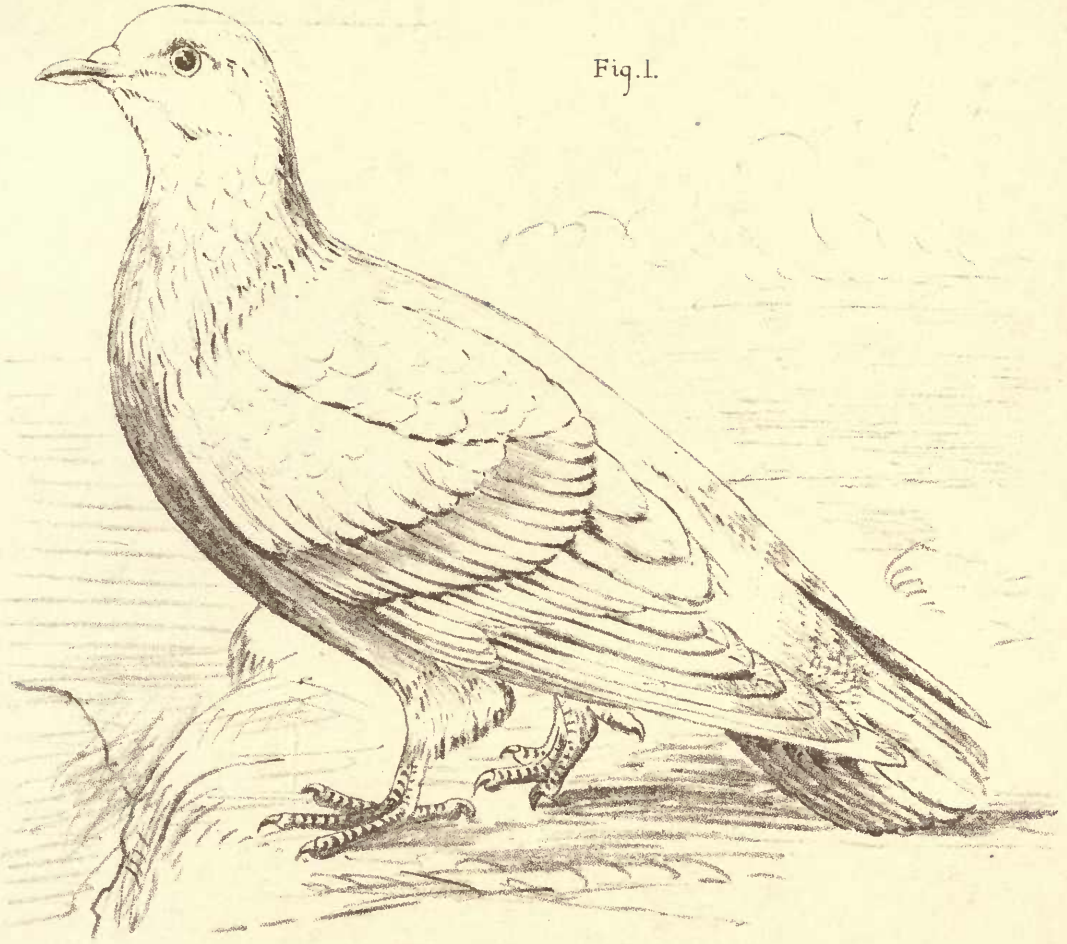


Fig.2.



Fig.3.

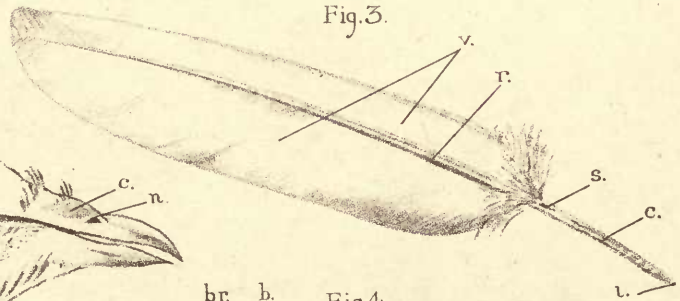


Fig.4.

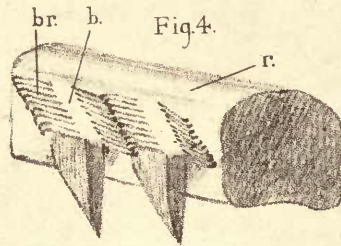


PLATE LVI.

Class—AVES—*continued.*

THE PIGEON—*continued.*

FIG. 1.—ALIMENTARY TRACT. $\times \frac{3}{4}$.

c. crop : *l.* liver : *pv.* proventriculus : *g.* gizzard : *d.* duodenum : *p.* pancreas : *i.* coils of the small intestine : *cm.* cæcum : *k.* middle lobe of the kidney : *t.* testis : *v.* vas deferens : *u.* ureter : *cl.* cloaca : *s.* syrinx : *b.* left bronchus.

FIG. 2.—RESPIRATORY TRACT. $\times 1$.

t. tongue : *h.* cornu of the hyoid : *g.* glottis : *tr.* trachea : *s.* syrinx : *l.* left lung indented by the ribs.

Fig.1.

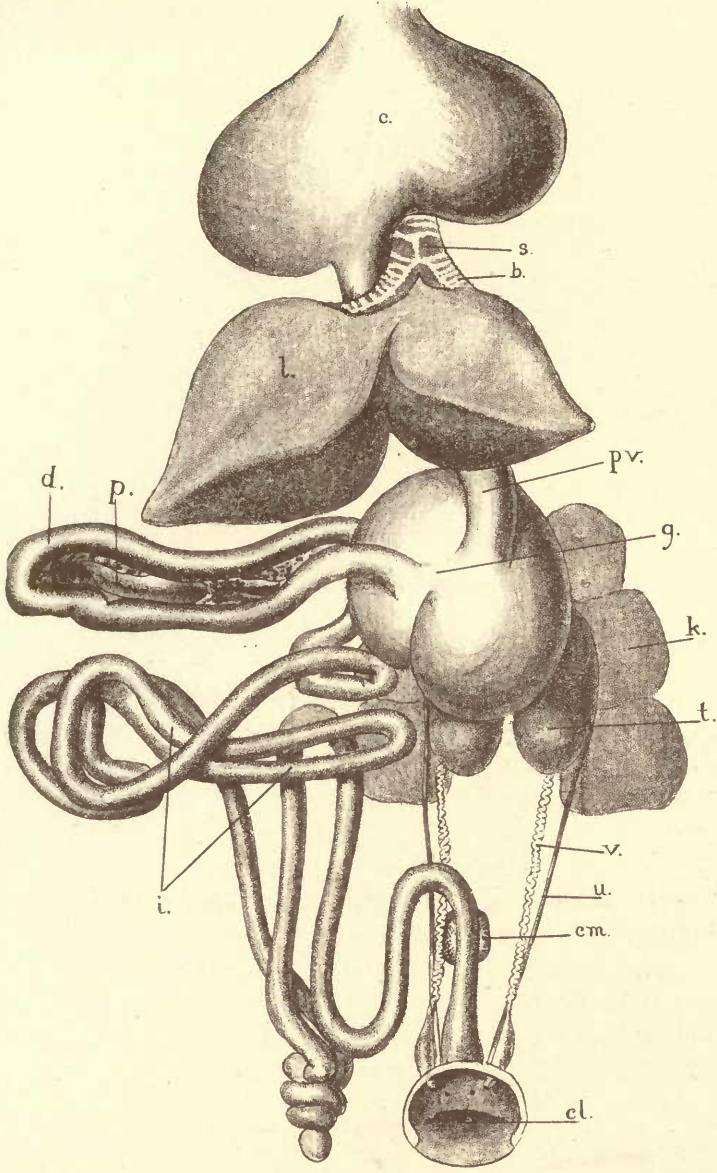


Fig.2.

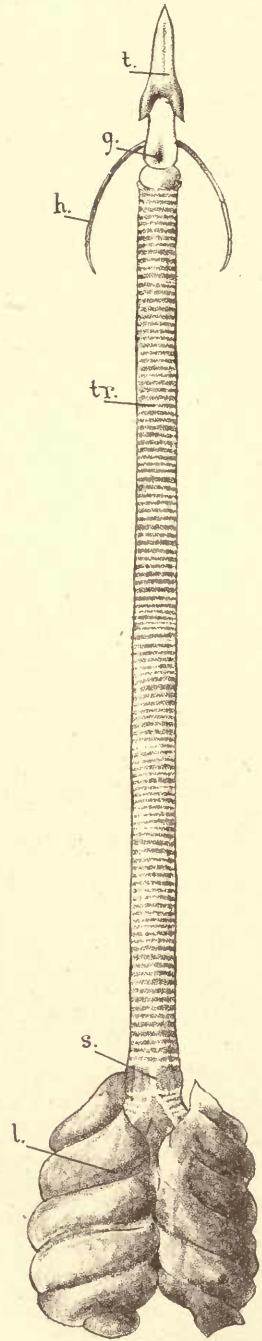


PLATE LVII.

Class—AVES—*continued*.

THE PIGEON—*continued*.

FIG. 1.—CIRCULATORY SYSTEM: VENTRAL VIEW. $\times 1$.

- $a.^1, a.^2$ right and left auricles: $v.^1, v.^2$ right and left ventricles.
 $a.$ aorta: $i.$ innominate arteries: $c.$ common carotid artery: $v.$ vertebral artery: $i. c.$ internal carotid artery: $e. c.$ external carotid artery: $b.$ brachial artery: $p. c.$ pectoral artery: $i. m.$ internal mammary artery.
 $cæ.$ coeliac artery: $s. m.$ superior mesenteric artery: $r.^1-r.^3$ renal arteries: $f.$ femoral artery: $sc.$ sciatic artery: $i. i.$ internal iliac artery and vein: $c.$ caudal artery and vein: $p. m.$ posterior mesenteric artery and vein.
 $j.$ jugular vein: $vr.$ vertebral vein: $b. v.$ brachial vein: $p. v.$ pectoral vein: $s. v.^1, s. v.^2$ right and left superior venæ cavæ.
 $c. m.$ coccygeo-mesenteric vein, joined by the posterior mesenteric vein: $r. p.$ renal-portal vein, formed by the coccygeo-mesenteric, caudal and internal iliac veins: $sc. v.$ sciatic vein: $f. v.$ femoral vein: $r. v.$ renal veins: $i. v.$ iliac veins: $ep.$ epigastric vein: $h.$ hepatic veins: $v. c. i.$ inferior vena cava.
 $p. a.$ left pulmonary artery. The right is seen crossing behind the innominate arteries.

Fig.I.

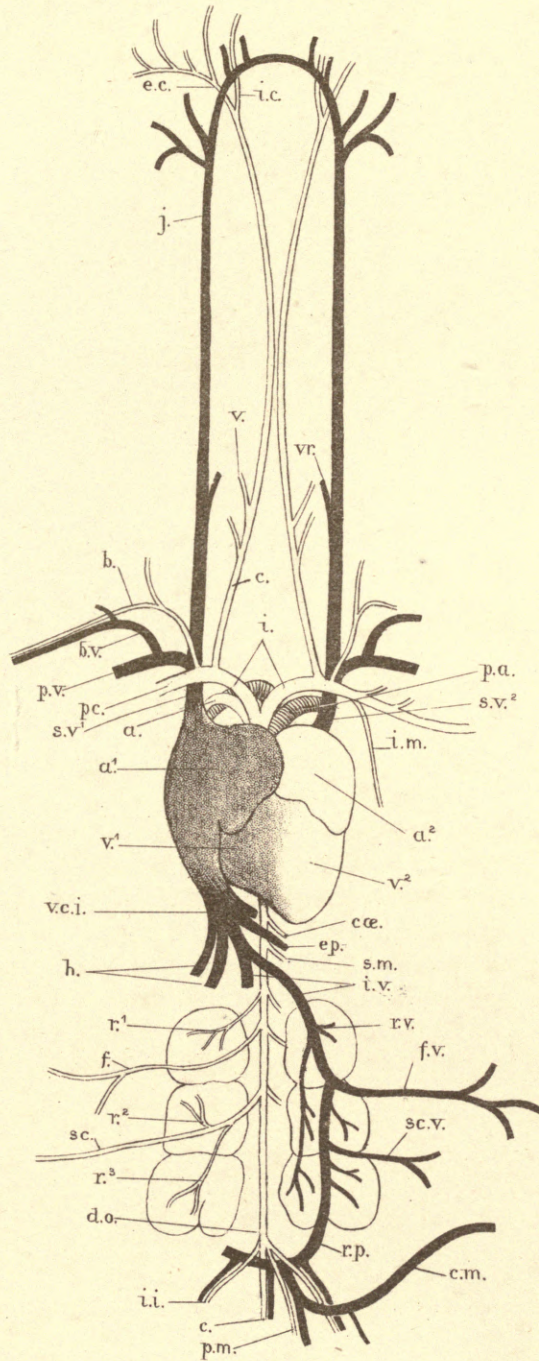


PLATE LVIII.

Class—AVES—*continued.*

THE PIGEON—*continued.*

FIG. 1.—SKELETON. $\times 1$.

s. skull: *c. v.* cervical vertebræ: *d. v.* dorsal vertebræ: *cd.* free caudal vertebræ: *p.* ploughshare bone: *u.* uncinatè processes on the dorsal ribs.

st. sternum: *s. r.* sternal ribs: *k.* keel: *c.* coracoid: *cl.* clavicle: *sc.* scapula: *h.* humerus: *r.* radius: *ul.* ulna: *c.¹*, *c.²* carpals: *m.¹*-*m.³* metacarpals: *p.¹*-*p.³* phalanges of the first to the third digits respectively.

il. ilium: *is.* ischium: *p.* pubes: *f.* femur: *t. t.* tibio-tarsus: *t. m.* tarso-metatarsus: *p.* phalanges.

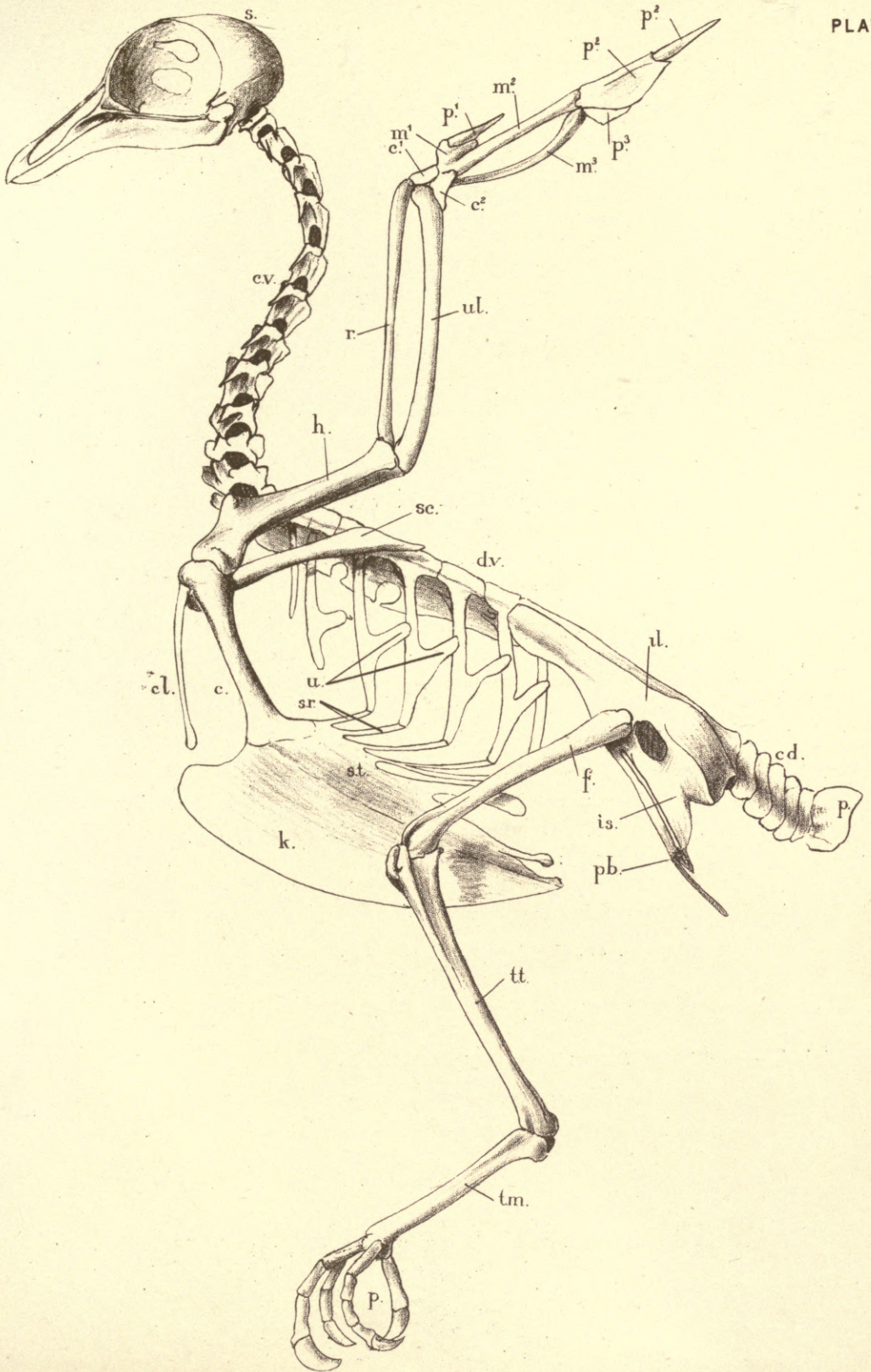


PLATE LIX.

Class—AVES—*continued*.

THE PIGEON—*continued*.

FIG. 1.—SKULL: DORSAL VIEW. $\times 1$.

p. parietal: *f.* frontal: *n.* nasal: *p.m.* premaxilla: *m.* maxilla:
j. jugal: *q.* quadrate.

FIG. 2.—SKULL: VENTRAL VIEW. $\times 1$.

f. foramen magnum: *s.* supra-occipital: *e.* ex-occipital: *c.* condyle:
b.o. basi-occipital: *p.s.* parasphenoid rostrum, or basisphenoid:
pt. pterygoid: *pl.* palatine: *m.* maxilla: *p.m.* premaxilla:
j. jugal: *q.* quadrate.

FIG. 3.—SKULL: SIDE VIEW. $\times 1$.

o. occipital: *p.* parietal: *f.* frontal: *or.* orbital plate of the frontal:
n. nasal: *p.m.* premaxilla: *m.* maxilla: *pl.* palatine: *j.* jugal:
q. quadrate: *t.* tympanic.

FIG. 4.—LOWER JAW: SIDE VIEW. $\times 1$.

ar. articular: *an.* angular: *s.* splenial: *d.* dentary.

FIG. 5.—WING BONES SHOWING THE ATTACHMENT OF THE FEATHERS. $\times \frac{2}{3}$.

FIG. 6.—SHOULDER GIRDLE: SIDE VIEW. $\times 1$.

g. glenoid cavity: *sc.* scapula: *cl.* clavicle: *co.* coracoid: *s.* sternum
with the sternal ribs attached: *k.* keel.

Fig. 1.

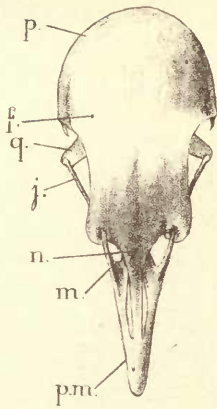


Fig. 2.

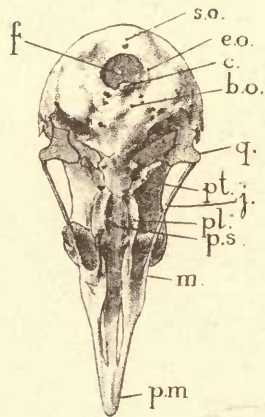


Fig. 3.

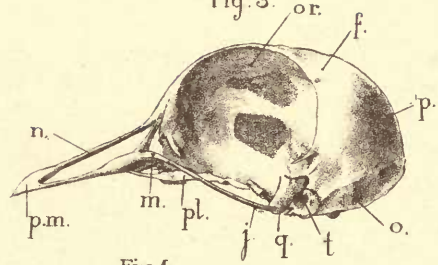


Fig. 4.



Fig. 5.

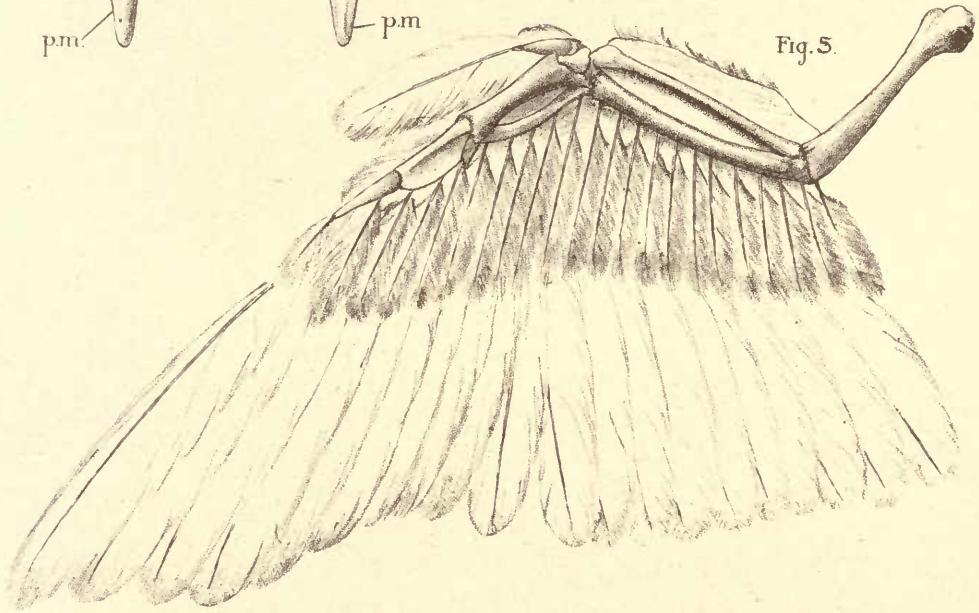


Fig. 6.

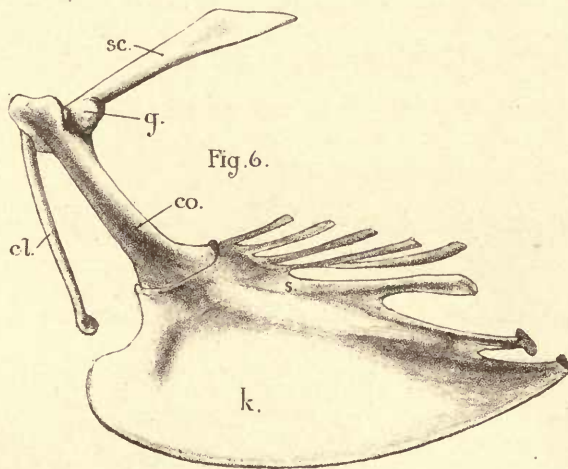


PLATE LX.

Class—AVES—*continued.*

THE PIGEON—*continued.*

FIG. 1.—PELVIS: DORSAL VIEW. × 1.

s. sacrum: *i.*, *i.* ilium: *is.* ischium: *p.* pubes.

FIG. 2.—PELVIS: VENTRAL VIEW. × 1.

FIG. 3.—SACRUM: LEFT SIDE VIEW. × 1.

FIG. 4.—LEFT OS INNOMINATUM. × 1.

a. acetabulum: *i.*, *i.* ilium: *is.* ischium: *p.* pubes: *i. s. f.* ilio-sciatic foramen.

FIG. 5.—RIGHT FEMUR. × 1.

FIG. 6.—RIGHT TIBIO-TARSUS.

t. tibia: *f.* fibula: *tr.* tarsal part of the tibio-tarsus.

FIG. 7.—BONES OF THE RIGHT PES.

t. m. tarso-metatarsus: I.-IV. phalanges of the four digits.

FIG. 8.—MESO-TARSAL ARTICULATION IN A YOUNG PIGEON. × 5.

t. tibia: *tr.*¹ proximal portion of the tarsus becoming united to the tibia: *tr.*² distal portion of the tarsus becoming united to the metatarsals: *mt.* metatarsals.

Fig. 1.

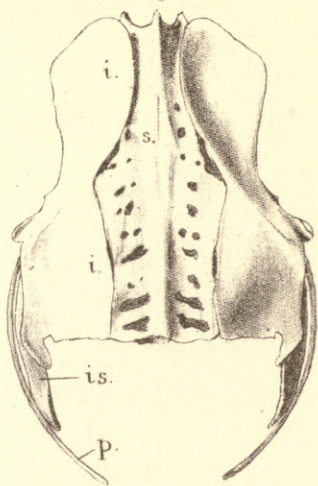


Fig. 2.

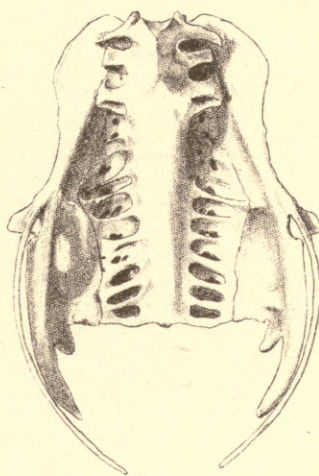


Fig. 3.



Fig. 4.

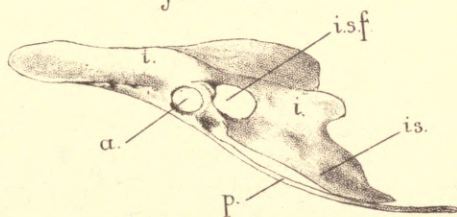


Fig. 6.

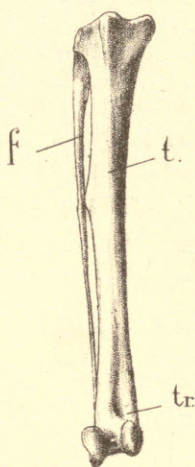


Fig. 5.

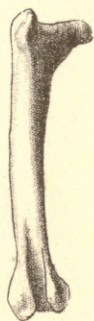


Fig. 7.

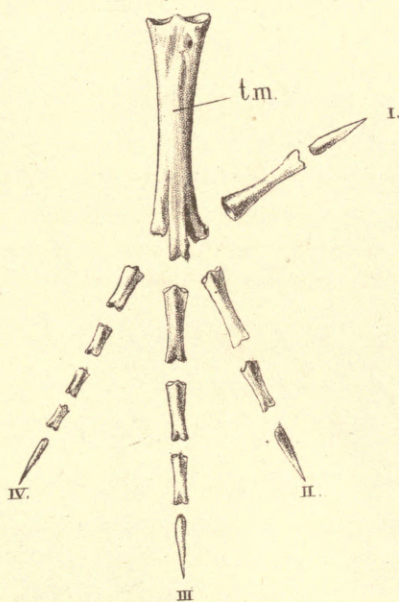
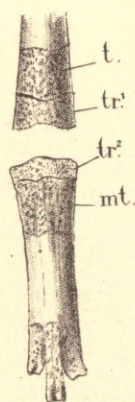


Fig. 8.



Class—AVES—*continued.*

THE PIGEON—*continued.*

FIG. 1.—BRAIN: DORSAL VIEW. $\times 2$.

o. olfactory lobes: *c.* cerebral lobes: *p.* pineal body: *op.* optic lobes:
cl. cerebellum: *m.* medulla oblongata.

FIG. 2.—BRAIN: VENTRAL VIEW. $\times 2$.

o. olfactory lobes: *c.* cerebral lobes: *o. t.* optic tract: *i.* infundibulum:
op. optic lobes: II.-XII. the various cranial nerves: *s.* first
spinal nerve.

FIG. 3.—BRAIN: DORSAL VIEW: AFTER REMOVAL OF THE CEREBELLUM AND PART
OF THE CEREBRAL AND OPTIC LOBES. $\times 2$.

f. foramen of Monro: *c.* corpus striatum: *t.* optic thalamus: *o. c.*
optic commissure: *v. o.* ventricle of the optic lobe: *v.⁴* fourth
ventricle: *p.* peduncles of the cerebellum: *m.* medulla
oblongata.

FIG. 4.—BRAIN: SIDE VIEW. $\times 2$.

o. olfactory lobe: *c.* cerebral lobe: *p.* pineal body: *cl.* cerebellum:
f. flocculus: *o. l.* optic lobe: *o. t.* optic tract: II.-XII. the
various cranial nerves: *s.* first spinal nerve.

FIG. 5.—BRAIN: LONGITUDINAL SECTION. $\times 2$.

o. olfactory lobe: *c.* cerebral lobe: *p.* pineal body: *cl.* cerebellum:
o. cm. optic commissure: *v.⁴* fourth ventricle: *a. c.* anterior
commissure: *v.³* third ventricle: *o. c.* optic chiasma: *p. c.*
posterior commissure: *i.* infundibulum: *py.* pituitary body:
m. medulla oblongata.

FIG. 6.—URINO-GENITAL SYSTEM: MALE. $\times \frac{4}{5}$.

t. testis: *v.* vas deferens: *s.* seminal vesicle: *k.* kidney: *u.* ureter:
c. cæcum: *r.* rectum: *cl.* cloaca.

FIG. 7.—URINO-GENITAL SYSTEM: FEMALE. $\times \frac{4}{5}$.

o. ovary: *o. d.¹* opening of the oviduct into the body cavity: *o. d.²*
opening of the oviduct into the cloaca: *r. o.* rudimentary
right oviduct: *k.* kidney: *u.* ureter: *cl.* cloaca.

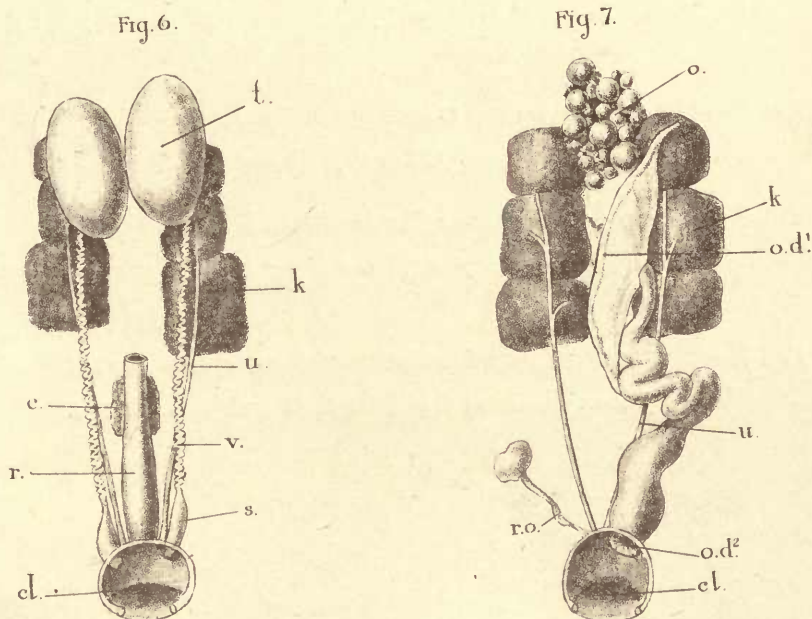
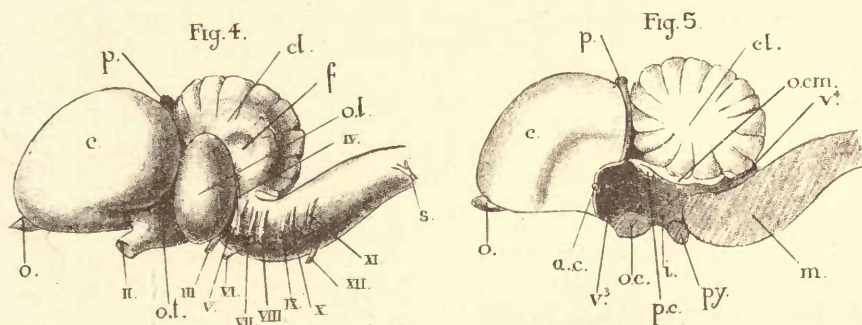
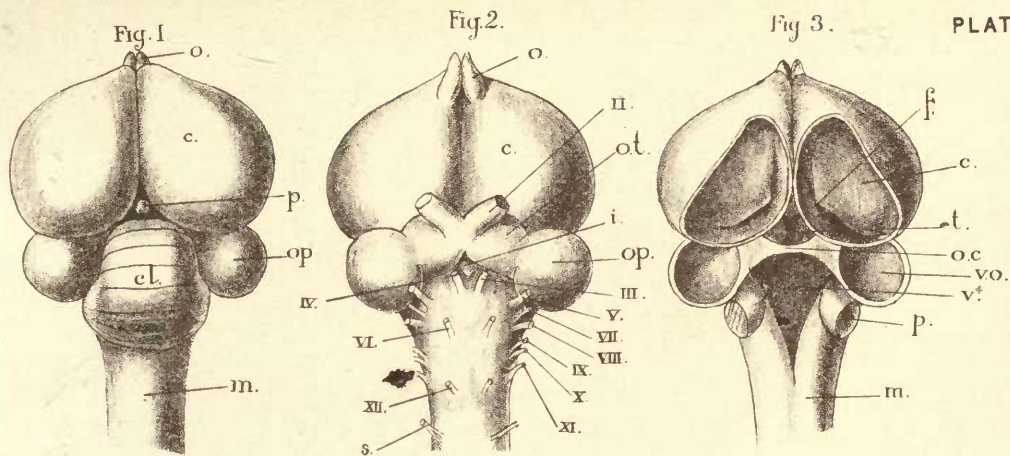


PLATE LXII.

Class—MAMMALIA.

THE RABBIT (*Lepus cuniculus*).

FIG. 1.—RABBIT. $\times \frac{1}{3}$.

FIG. 2.—PART OF THE HEAD. $\times \frac{2}{3}$.

n. nictitating membrane or third eyelid drawn back by forceps.

FIG. 3.—TONGUE: DORSAL VIEW. $\times 1$.

t. tongue: *f.* papillæ foliatæ: *c.* circumvallate papillæ: *e.* epiglottis:
a. arytenoid cartilage: *tr.* trachea laid open.

FIG. 4.—ŒSOPHAGUS AND TRACHEA: SIDE VIEW. $\times 1$.

e. epiglottis: *th.* thyroid cartilage: *c.* cricoid cartilage: *tr.* right lobe
of the thyroid gland: *i.* isthmus of the thyroid: *t.* trachea:
œ. œsophagus.

FIG. 5.—EPIGLOTTIS: VIEWED FROM BEHIND. $\times 1$.

e. epiglottis: *c.* cornu of the thyroid cartilage.

FIG. 6.—LARYNX AND TRACHEA: LONGITUDINAL SECTION. $\times 1$.

e. epiglottis: *a.* arytenoid cartilage: *v.* right vocal cord: *c.* cricoid
cartilage.

FIG. 7.—PAPILLÆ FOLIATÆ: LONGITUDINAL SECTION CROSSING THE FOLIA. $\times \frac{5}{2}$.

Only the epithelium *e.* and the taste buds *t.* are shown.

Fig. 1.

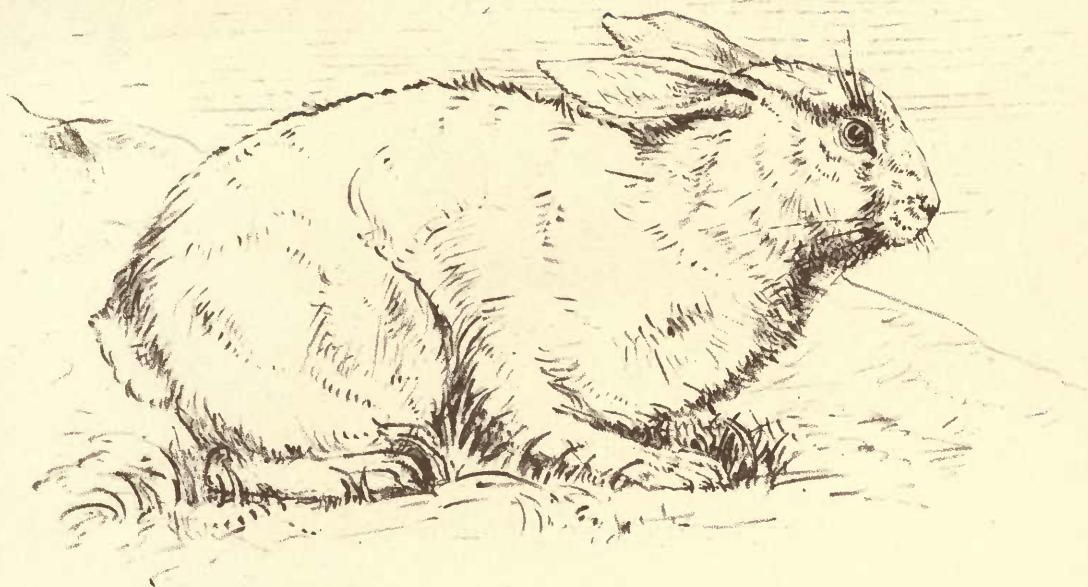


Fig. 2.

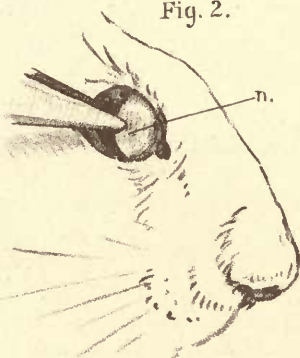


Fig. 3.

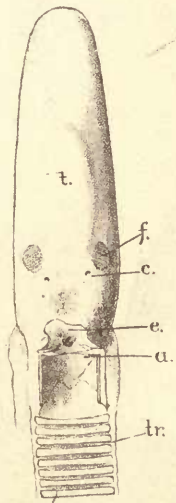


Fig. 4.

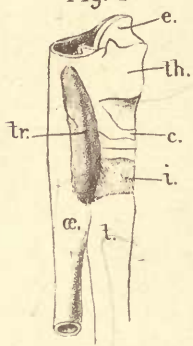


Fig. 5.

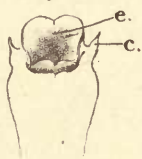


Fig. 6.

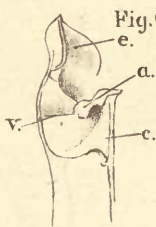


Fig. 7.



PLATE LXIII.

Class—MAMMALIA—*continued.*

THE RABBIT—*continued.*

FIG. 1.—VISCERA IN POSITION. $\times \frac{1}{2}$.

h. heart: *l.* left lung: *lr.* liver: *st.* stomach: *cæ.* cæcum: *c.* colon:
i. small intestine: *r.* rectum: *b.* bladder.

FIG. 2.—ALIMENTARY CANAL LAID OUT. $\times \frac{1}{2}$.

æs. œsophagus: *st.* stomach with *s.* spleen attached: *b.* bile duct:
d.¹, d.² duodenum: *p.* pancreas: *p.d.* pancreatic duct: *i.*
outline of the coils of the small intestine: *s.r.* sacculus
rotundus: *cæ.* cæcum: *a.* appendix vermiformis: *c.* colon: *r.*
beginning of the rectum.

Fig. 2

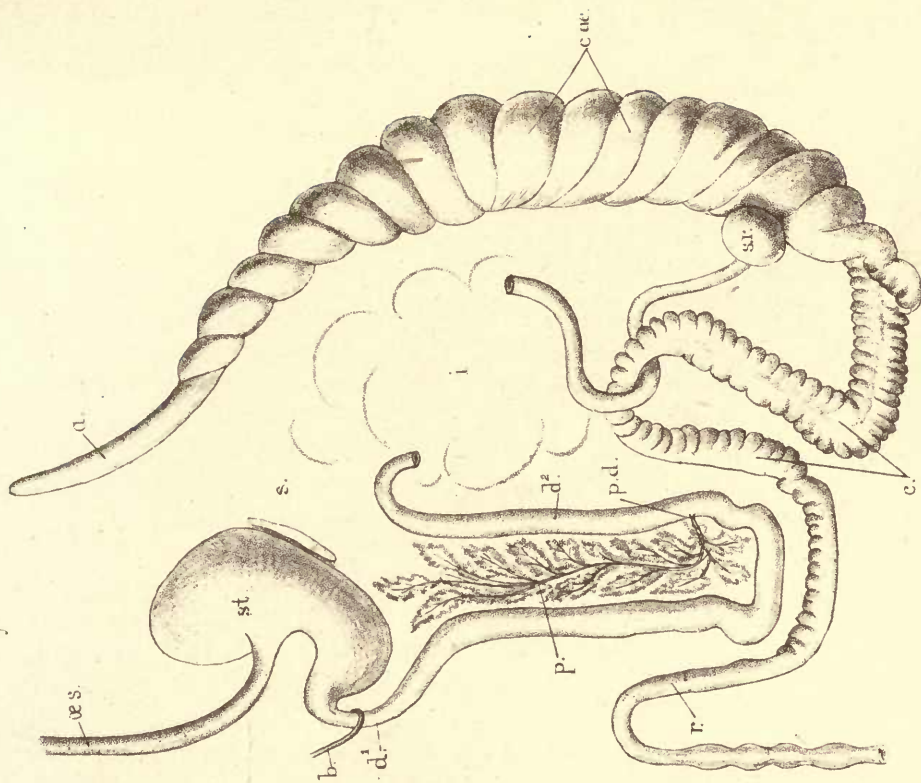
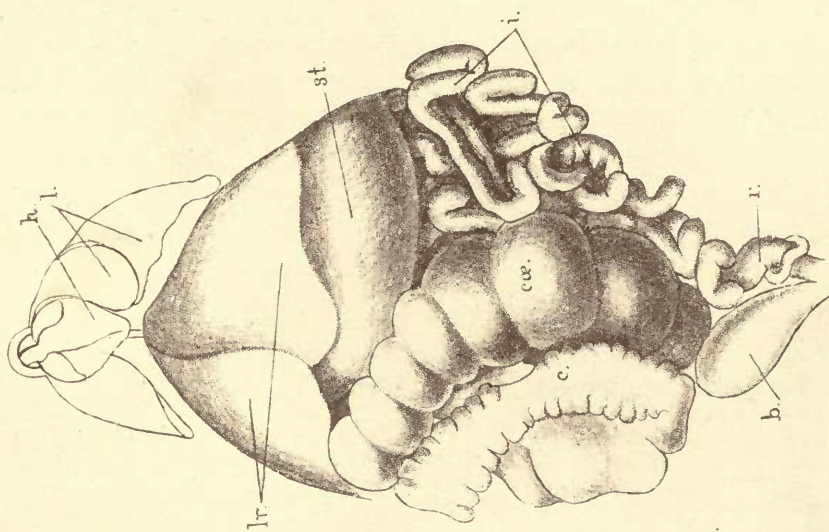


Fig. 1.



Class—MAMMALIA—continued.

THE RABBIT—continued.

FIG. 1.—CIRCULATORY SYSTEM: VENTRAL VIEW. \times about $\frac{1}{2}$.

- e.j.* external jugular vein: *i.j.* internal jugular vein: *sc.v.* subclavian vein: *v.c.¹* right superior vena cava: *a.i.* anterior intercostal vein: *v.a.* vena azygos receiving intercostal veins: *v.c.²* left superior vena cava.
- h.* heart: *a.a.* arch of the aorta: *i.* innominate artery: *s.¹, s.²* right and left subclavian arteries: *v.* vertebral artery: *r.c.* right common carotid artery: *l.c.* left common carotid artery: *ao.* dorsal or descending aorta giving off intercostal arteries: *c.* coeliac artery: *m.* superior mesenteric artery: *r.* renal artery: *i.m.* inferior mesenteric artery: *s.p.* spermatic artery: *m.s.* median sacral artery: *c.i.* common iliac artery: *i.l.* ilio-lumbar artery: *i.i.* internal iliac artery: *e.i.* external iliac artery.
- i.i.v.* internal iliac vein: *c.i.v.* common iliac vein: *e.i.v.* external iliac vein: *r.v.* renal vein from *k.* kidney: *ad.¹, ad.²* right and left adrenals: *h.¹-h.³* hepatic veins: *p.p.* posterior phrenic veins; *v.c.³* inferior vena cava.

FIG. 2.—HEART AND GREAT VESSELS: VENTRAL VIEW. \times 1.

- v.¹* right superior vena cava: *v.²* left superior vena cava: *v.³* inferior vena cava: *r.a.* right auricle: *r.v.* right ventricle: *in.* infundibulum: *p.* pulmonary artery: *l.a.* left auricle: *l.v.* left ventricle: *a.* arch of the aorta: *i.* innominate artery: *s.¹, s.²* right and left subclavian arteries: *c.¹, c.²* right and left common carotid arteries.

FIG. 3.—HEART AND GREAT VESSELS: DORSAL VIEW. \times 1.

- v.¹* right superior vena cava: *v.²* left superior vena cava: *v.³* inferior vena cava: *r.a.* right auricle: *l.a.* left auricle: *ve.* ventricular portion of the heart: *p.* pulmonary artery: *a.* arch of the aorta: *i.* innominate artery: *s.¹, s.²* right and left subclavian arteries: *c.¹, c.²* right and left common carotid arteries.

FIG. 4.—HEART AND LUNGS: VENTRAL VIEW. \times 1.

- v.¹, v.², v.³* the three venæ cavæ: *a.* arch of the aorta: *i.* innominate artery: *t.* trachea: *r.* right lung: *l.* left lung.

Fig 1.

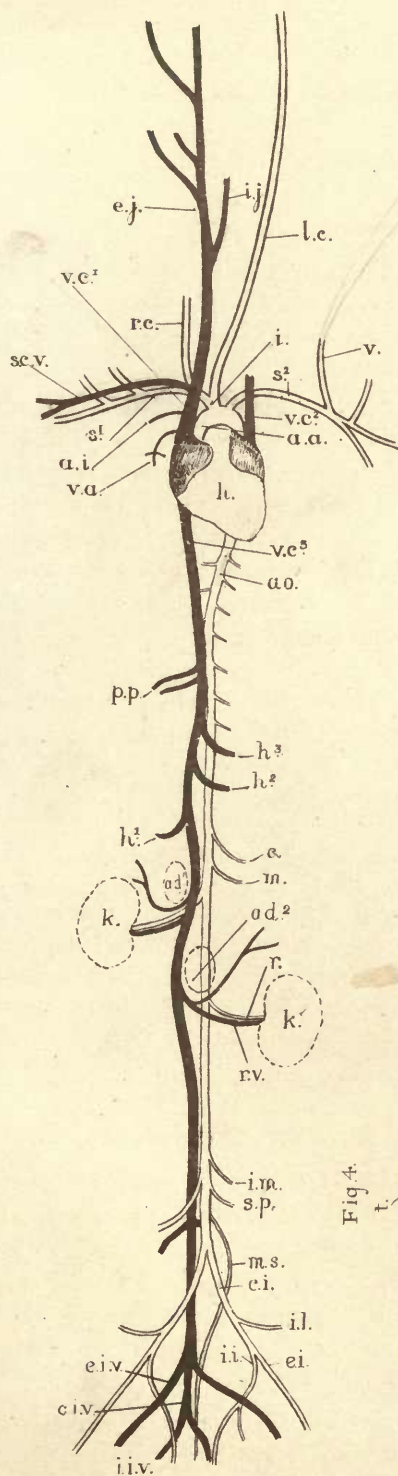


Fig 2.

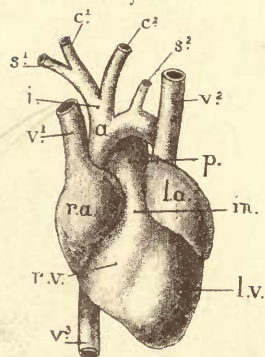


Fig 3.

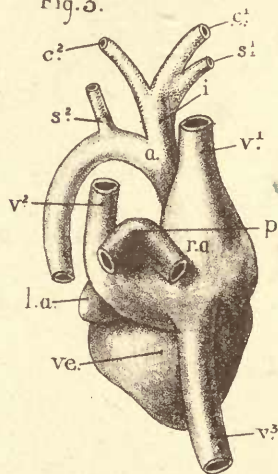


Fig 4.

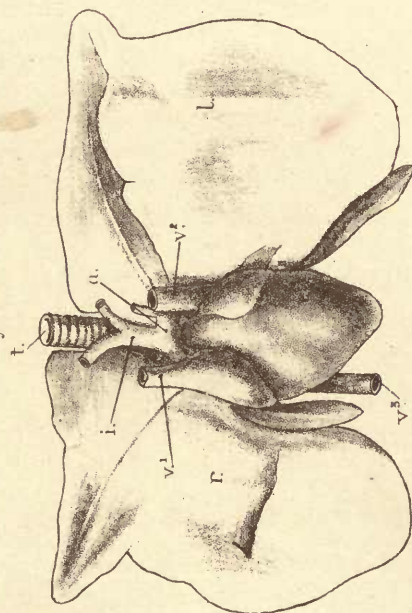


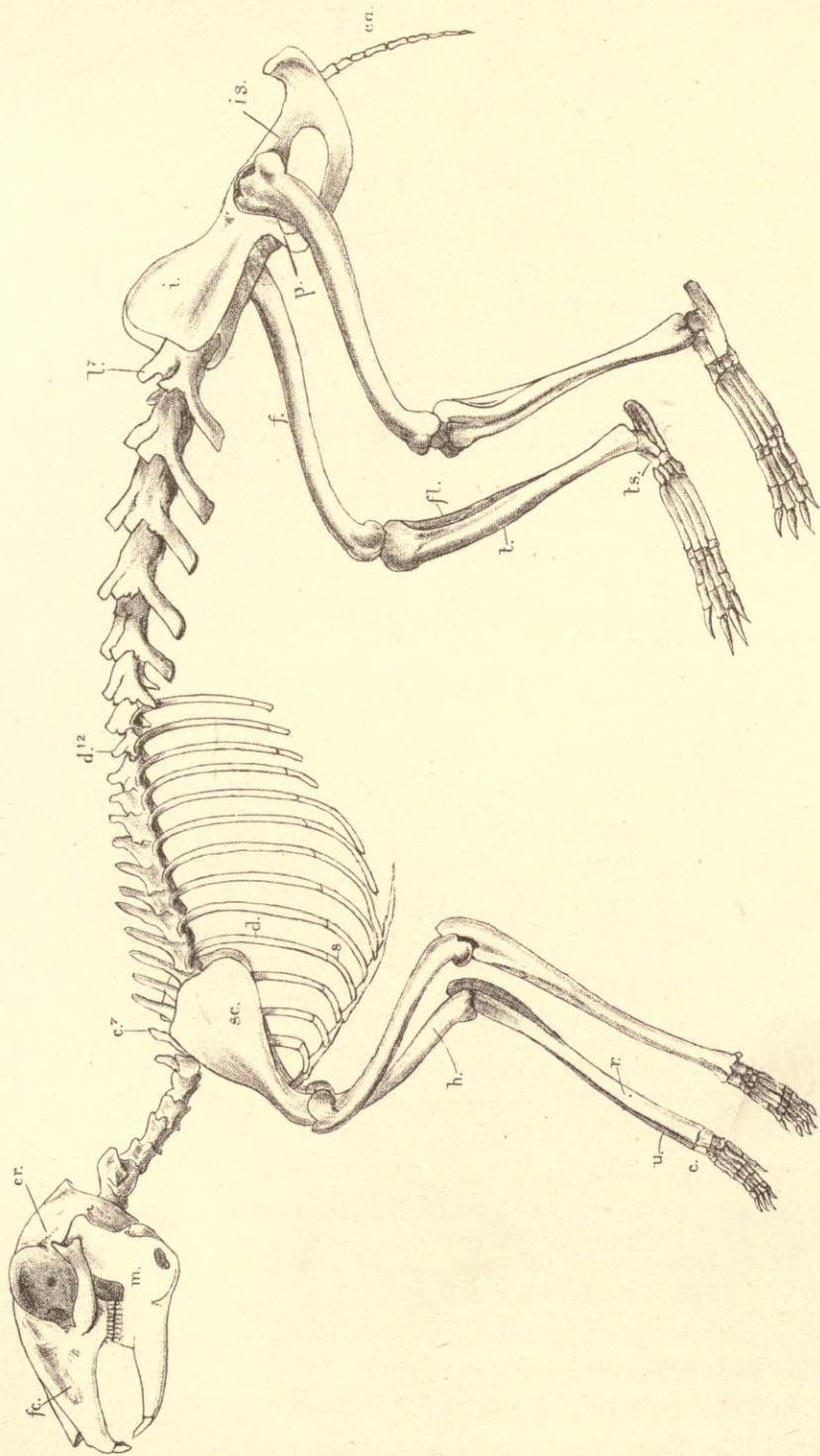
PLATE LXV.

Class—MAMMALIA—*continued.*

THE RABBIT—*continued.*

FIG. 1.—SKELETON. $\times \frac{1}{2}$.

cr. cranial region of the skull; *fc.* facial region: *m.* lower jaw: *c.*⁷ last cervical vertebra: *d.*¹² last dorsal vertebra: *l.*⁷ last lumbar vertebra: *ca.* caudal vertebræ: *d.* dorsal portion of rib: *s.* sternal portion of rib (In the specimen represented in this plate there were thirteen ribs): *sc.* scapula: *h.* humerus: *u.* ulna: *r.* radius: *c.* carpus: *i.* ilium: *is.* ischium: *p.* pubes: *f.* femur: *t.* tibia: *fl.* fibula: *ts.* tarsus.



Class—MAMMALIA—*continued.*

THE RABBIT—*continued.*

FIG. 1.—SECOND LUMBAR VERTEBRA: FRONT VIEW. $\times 1$.

c. centrum: *s.* spinous process: *t.* transverse process: *m.* metapophysis: *h.* hypapophysis.

FIG. 2.—FIRST CERVICAL VERTEBRA OR ATLAS: FRONT VIEW. $\times 1$.

f. articular facet for the condyle of the skull: *t.* transverse process.

FIG. 3.—SECOND CERVICAL VERTEBRA OR AXIS: FRONT VIEW. $\times 1$.

o. odontoid process: *f.* vertebrarterial canal: *p. z.* posterior zygapophysis.

FIG. 4.—FIRST AND SECOND CERVICAL VERTEBRÆ: SIDE VIEW. $\times 1$.

*a.*¹ atlas: *a.*² axis.

FIG. 5.—SECOND LUMBAR VERTEBRA: SIDE VIEW. $\times 1$.

s. spinous process: *t.* transverse process: *m.* metapophysis: *z.* posterior zygapophysis: *a.* anapophysis: *h.* hypapophysis.

FIG. 6.—STERNUM: FRONT VIEW. $\times 1$.

*s.*¹ first sternebra or manubrium: *s.*⁶ sixth sternebra: *x.* xiphoid cartilage.

FIG. 7.—SKULL: DORSAL VIEW. $\times 1$.

s.o. supra-occipital: *i.* interparietal: *p.* parietal: *f.* frontal: *n.* nasal: *p.* premaxilla: *z.* zygomatic arch.

FIG. 8.—BASE OF THE SKULL. $\times 1$.

f. m. foramen magnum: *s.o.* supra-occipital: *o. c.* occipital condyle: *t.* tympanic bulla: *b.o.* basi-occipital: *b.s.* basi-sphenoid: *pt.* pterygoid: *a.s.* ali-sphenoid: *g.* glenoid fossa: *p.* palatine: *p. p.* palatine process of the maxilla: *m.* maxilla: *p. m.* premaxilla.

FIG. 9.—SKULL: SIDE VIEW. $\times 1$.

s.o. supra-occipital: *p.o.* par-occipital process: *t.* tympanic bulla: *s.* squamosal: *pt.* pterygoid: *a.s.* ali-sphenoid: *o.* optic foramen: *z.*¹, *z.*² malar (jugal) and squamosal portions of the zygomatic arch: *f.* frontal: *l.* lachrymal: *m.* maxilla: *p. m.* premaxilla: *n.* nasal.

FIG. 10.—LOWER JAW: SIDE VIEW. $\times 1$.

r. ramus: *a.* angle: *c.* condyle: *c. p.* coronoid process.

FIGS. 11 and 12.—HYOID: SIDE AND FRONT VIEWS. $\times 1$

b. body: *c.*¹, *c.*² anterior and posterior cornua.

Fig. 1.

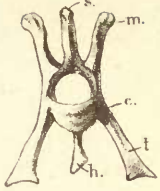


Fig. 2.



Fig. 3.

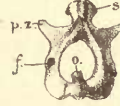


Fig. 4.



Fig. 5.

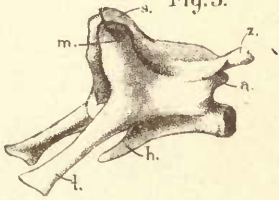


Fig. 6.



Fig. 7.

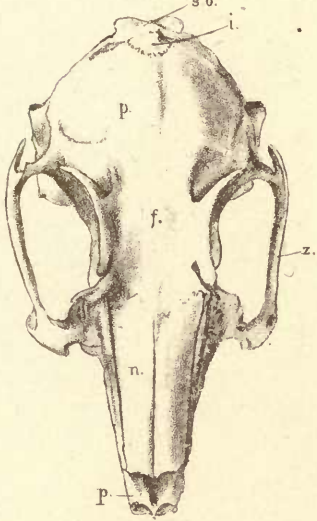


Fig. 11.



Fig. 12.

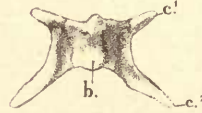


Fig. 8.

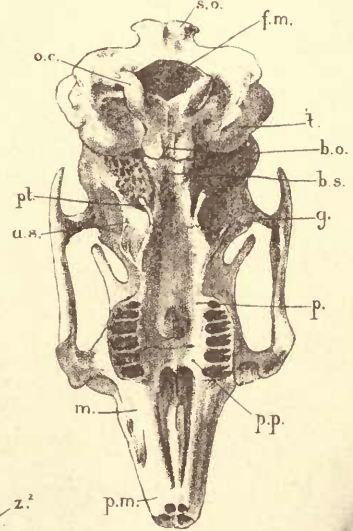


Fig. 9.

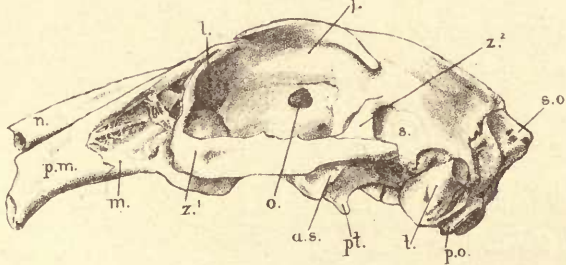


Fig. 10. c.p.

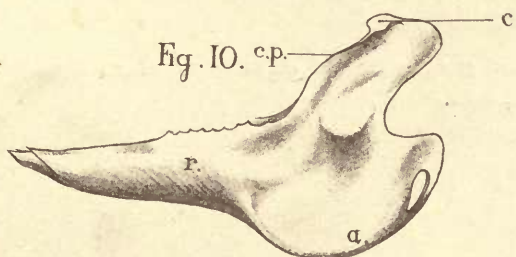


PLATE LXVII.

Class—MAMMALIA—*continued.*

THE RABBIT—*continued.*

FIG. 1.—RIGHT SCAPULA: DORSAL VIEW. $\times 1$.

s.s. supra-scapula: *s.* spine: *a.* acromion process: *m.* metacromion process: *c.* coracoid process: *g.* glenoid cavity.

FIG. 2.—CLAVICLE. $\times 1$.

FIG. 3.—HUMERUS. $\times 1$.

FIG. 4.—ULNA AND RADIUS: SIDE VIEW. $\times 1$.

u. ulna: *o.* olecranon process: *s.* sigmoid cavity: *r.* radius.

FIG. 5.—BONES OF THE MANUS. $\times 1$.

c. carpal bones: *m.* metacarpal bones: *p.* phalanges.

FIG. 6.—PELVIS: FRONT VIEW. \times about $\frac{1}{2}$.

*s.*¹ first sacral vertebra: *a.* acetabulum: *il.* ilium: *is.* ischium: *p.* pubes: *s.* symphysis: *c.* caudal vertebræ.

FIG. 7.—LEFT OS INNOMINATUM: SIDE VIEW. $\times 1$.

a. acetabulum: *il.* ilium: *is.* ischium: *p.* pubes: *s.* symphysis pubis.

FIG. 8.—FEMUR: FRONT VIEW. $\times 1$.

FIG. 9.—TIBIA AND FIBULA: FRONT VIEW. $\times 1$.

t. tibia: *f.* fibula.

FIG. 10.—BONES OF THE PES. $\times 1$.

t. tarsal bones: *c.* calcaneum: *a.* astragalus: *m.* metatarsal bones: *p.* phalanges.

Fig. 1.

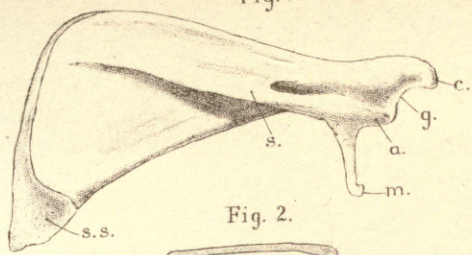


Fig. 2.

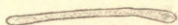


Fig. 3.



Fig. 4.

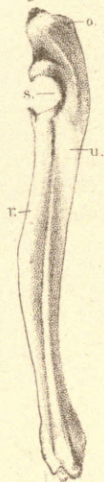


Fig. 7.

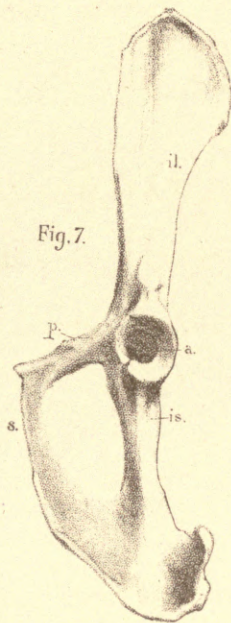


Fig. 8.

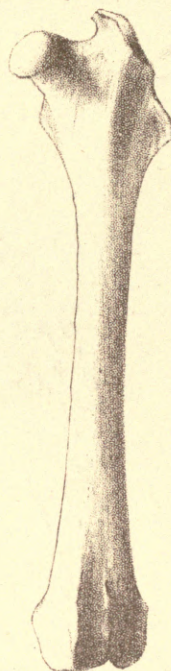


Fig. 5.

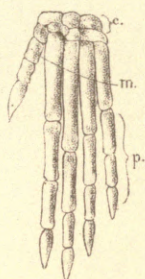


Fig. 10.

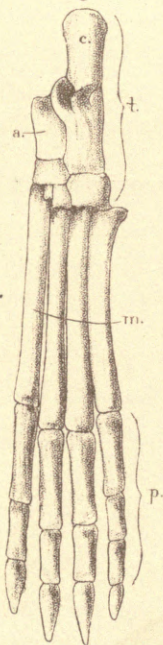


Fig. 9.

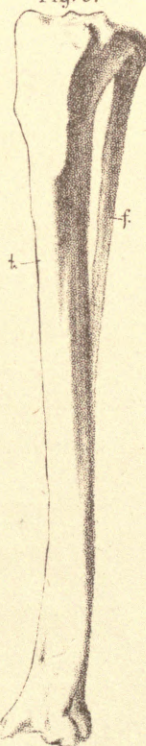
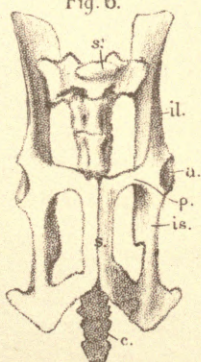


Fig. 6.



Class—MAMMALIA—*continued.*

THE RABBIT—*continued.*

FIG. 1.—BRAIN : DORSAL VIEW. × 1.

o. olfactory lobes : *c.* cerebral lobes : *c. q.* corpora quadrigemina : *c.m.* cerebellum : *f.* flocculus : *m.* medulla oblongata.

FIG. 2.—BRAIN : VENTRAL VIEW. × 1.

o. olfactory lobes : *c.* cerebral lobes : *p.* pituitary body : II.-XII. the various cranial nerves : *s.*¹ first spinal nerve.

FIG. 3.—BRAIN : LONGITUDINAL SECTION. × 1.

o. olfactory lobe : *c.* cerebral lobe : *f.* fornix : *c. c.* corpus callosum : *v.*³ third ventricle : *p.* pineal body : *q.* corpora quadrigemina : *c.m.* cerebellum : *v.*⁴ fourth ventricle : *p.* pons Varolii : *c. a.* corpus albicans : *py.* pituitary body : *m.* middle commissure : *a.* anterior commissure.

FIG. 4.—DISSECTION OF PART OF THE NECK. × 1.

j. left half of the lower jaw : *t.* trachea : *s.m.* sterno-mastoid muscle : *c.* cornu majus of the hyoid bone : *s.h.* stylo-hyoid muscle (The nerve crossing beneath it is the hypoglossal) : *s.* salivary glands : *j. v.* jugular vein.

FIG. 5.—DEEPER DISSECTION OF THE SAME PART. × 1.

m. middle line of the body : *t.* trachea : *c.* bifurcation of the carotid artery : *h., h.* hypoglossal nerve : *s., s.* sympathetic nerve : *p., p.* pneumogastric nerve : *l.* superior laryngeal nerve : *d.* cardiac depressor nerve.

FIG. 6.—LONGITUDINAL SECTION OF THE EYE. × 1.

e. upper eyelid : *cv.* fold of the conjunctiva : *cr.* cornea : *m., m.* muscles of the eyeball : *s.* sclerotic : *c.* choroid : *r.* retina : *o.* optic nerve.

FIG. 7.—SECTION OF THE ANTERIOR PORTION OF THE EYE. × 2.

sc. sclerotic : *cv.* conjunctiva : *i.* iris : *a.* anterior aqueous chamber : *p.* posterior aqueous chamber : *l.* lens : *v.* chamber of the vitreous : *c. m.* ciliary muscle : *c. p.* ciliary process.

Fig.1.

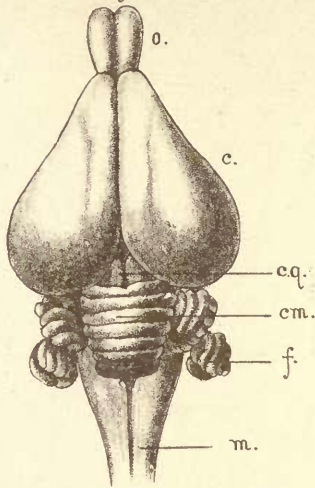


Fig.2.

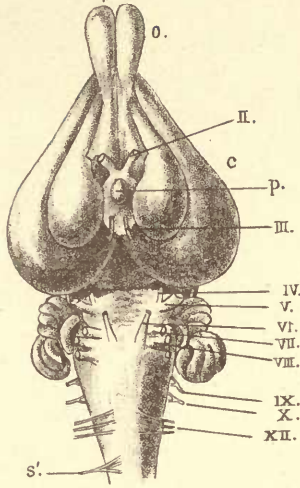


Fig.3.

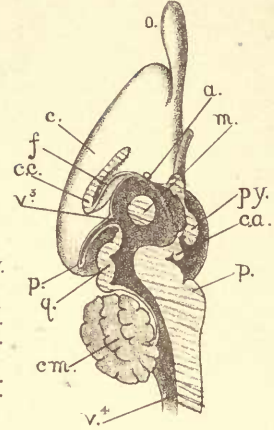


Fig.4.

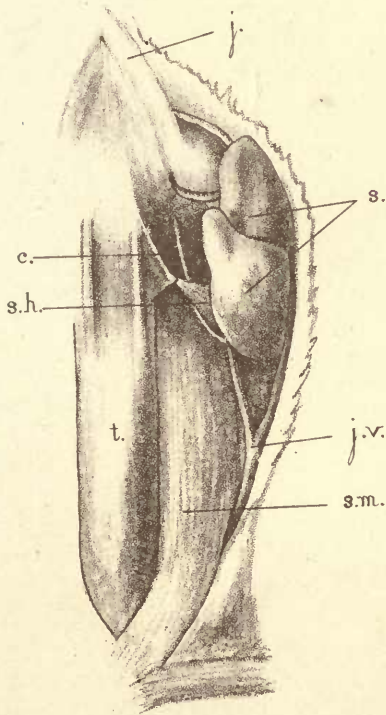


Fig.5.

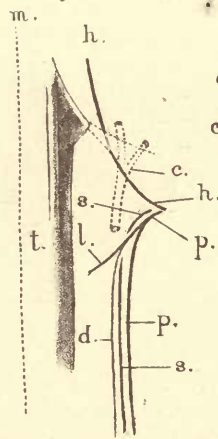


Fig.6.

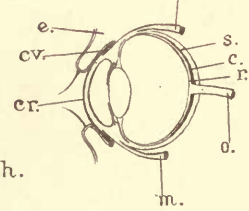


Fig.7.

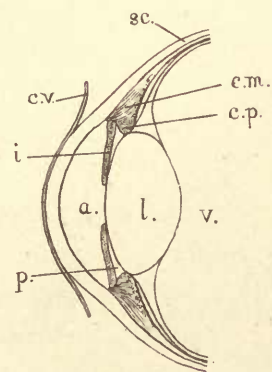


PLATE LXIX.

Class—MAMMALIA—*continued*.

THE RABBIT—*continued*.

FIG. 1.—URINO GENITAL SYSTEM: MALE: FRONT VIEW. $\times 1$.

s. s. scrotal sac: *f.* fatty tissue containing the spermatic artery and vein: *t.* testis: *ct.* caput epididymis: *cd.* cauda epididymis: *gb.* gubernaculum testis: *v.* vas deferens: *u.* ureter: *b.* bladder: *u. m.* uterus masculinus: *p.¹, p.²* lobes of the prostate: *c.* Cowper's gland: *r. g.* rectal gland: *p. g.* perineal gland: *c. p.* crus penis: *c. c.* corpus cavernosum penis: *g.* glans penis.

FIG. 2.—URINO-GENITAL SYSTEM: MALE: VIEW FROM THE LEFT SIDE. $\times 1$.

u. ureter: *b.* bladder: *v.* vas deferens: *u. m.* uterus masculinus: *p.¹, p.²* lobes of the prostate: *c.* Cowper's gland: *r.* rectum: *r. g.* rectal gland: *p. g.* perineal gland: *p. g. o.* opening of the perineal gland: *c. c.* corpus cavernosum penis: *c. s.* corpus spongiosum penis: *g.* glans penis: *a.* anus.

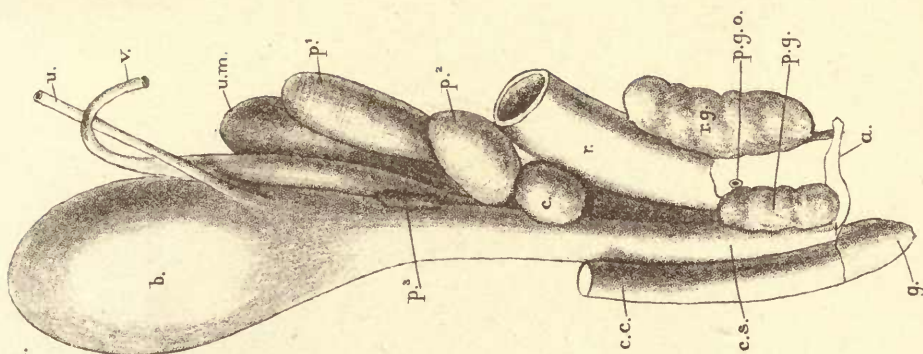


Fig. 2.

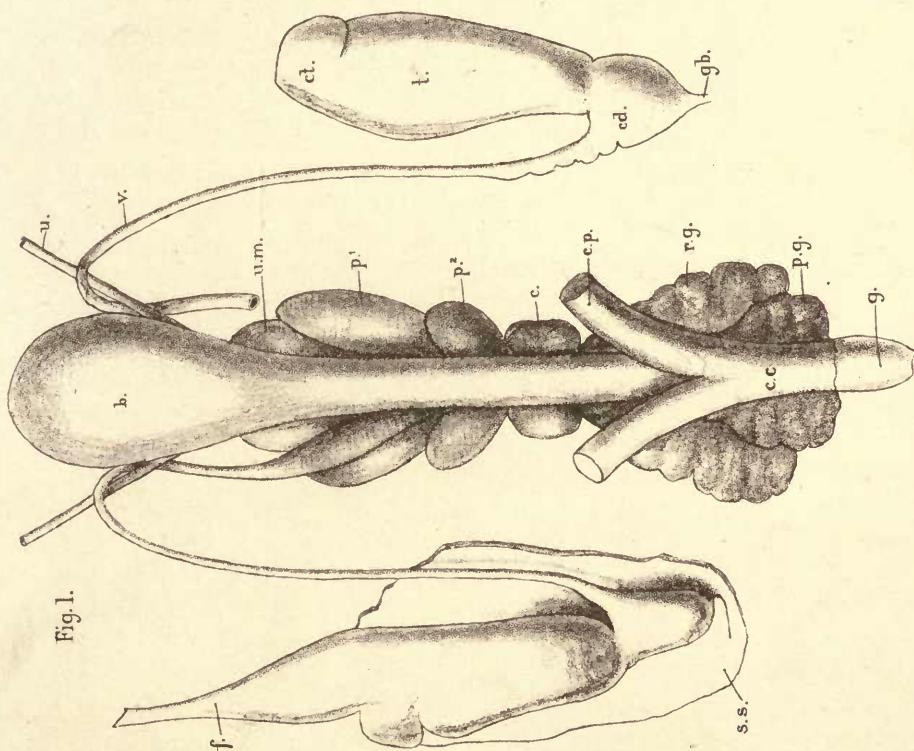


Fig. 1.

PLATE LXX.

Class—MAMMALIA—*continued*.

THE RABBIT—*continued*.

FIG. 1.—URINO-GENITAL SYSTEM: FEMALE: FRONT VIEW. $\times \frac{1}{2}$.

k. kidney: *u.* ureter: *b.* bladder: *o.* ovary: *f.* opening of the Fallopian tube (oviduct): *b.l.* part of the broad ligament: *ut.* right uterus: *v.* vagina: *vs.* vestibule: *r.* rectum: *a.* anus: *r.g.* rectal gland: *p.g.* perineal gland.

FIG. 2.—URINO-GENITAL SYSTEM: FEMALE: VIEW FROM THE LEFT SIDE. $\times \frac{1}{2}$.

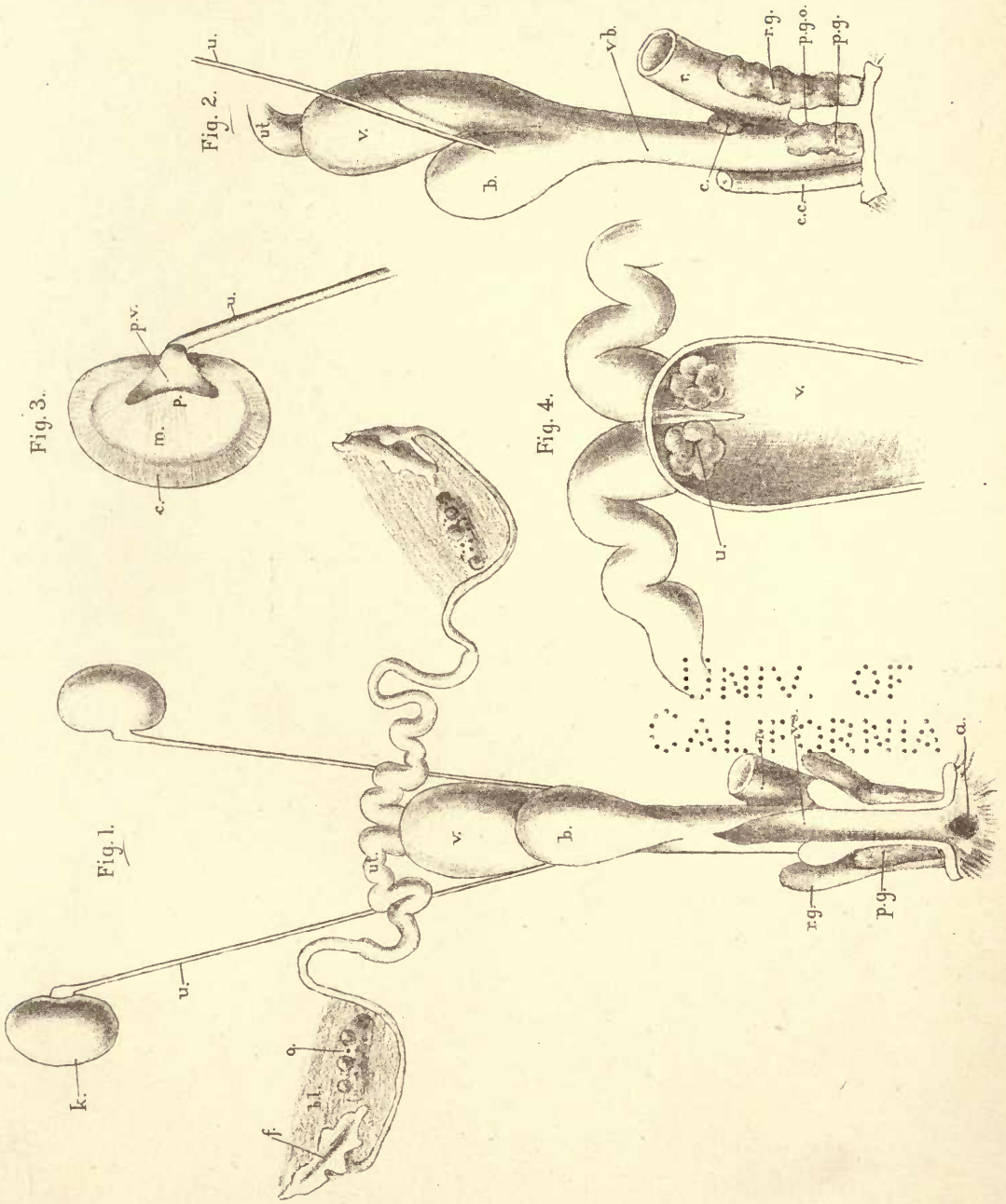
u. ureter: *b.* bladder: *ut.* uterus: *v.* vagina: *vb.* vestibule: *c.* Cowper's gland: *r.* rectum: *r.g.* rectal gland: *p.g.* perineal gland: *p.g.o.* opening of perineal gland: *c.c.* corpus cavernosum clitoridis.

FIG. 3.—LONGITUDINAL SECTION OF THE RIGHT KIDNEY. $\times 1$.

c. cortex: *m.* medulla: *p.* pyramid: *pv.* pelvis of the kidney: *u.* ureter.

FIG. 4.—DISSECTION SHOWING THE OPENINGS OF THE TWO UTERI. $\times 1$.

v. vagina: *u.* opening of the right uterus.



APPENDIX.

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ERRATUM.

VIII. HEADING.—For *Distomum lanceolatum* read *Distomum hepaticum*.



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